

San Bernardino County Stormwater Program

Annual Report

Reporting Year (Fiscal Year)
July 2006 to June 2007



For Compliance with Order No. R8-2002-0012
NPDES Permit No. CAS618036

Prepared By
San Bernardino County Flood Control District
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Executive Summary

Accomplishments this Reporting Year

The Stormwater Program and the Permittees continued to implement the requirements of the Municipal Stormwater Permit during fiscal year 2006-07. Through the Management Committee and the subcommittees, priorities were established and specific program elements were developed and implemented. Highlights of the Permittees accomplishments this year are described below.

- **MS4 Database Development**

The MS4 Database Subcommittee and the Consultant (CDM) continued to develop and refine the new database. The MS4 Database facilitates tracking and reporting of most Stormwater Program activities, including inspections, municipal activities, outreach and fiscal data. The MS4 Database is available to all Permittees via the World Wide Web, and has the capability for inspection data to be entered in real time using mobile data devices. The Stormwater Program has granted limited access to Regional Board staff for review of permittee data. Configuration and implementation of the CityWorks® municipal work management software was begun in late 2005. Although it was anticipated to have this program partially operational by early 2007, it has been delayed due to a delayed release of the required ESRI GIS software, and by the need to purchase and configure the needed hardware. Barring further delays, CityWorks® should be operational by March or April 2008.

- **Construction Inspector Training**

A construction inspector training workshop was conducted on September 14, 2006, with assistance from Centex Homes. The workshop was attended by over 50 staff and included a construction field visit and a classroom presentation.

- **Submitted the ROWD**

The Permittees evaluated the MSWMP and the existing management structure during the development of a new Report of Waste Discharge (ROWD) as application for the fourth-term Permit. The recommended revisions to the MSWMP were submitted to the Regional Board with the ROWD in October 2006.

- **Implementation Agreement Revision**

The Implementation Agreement for the Stormwater Program was reviewed during the ROWD process and will be revised to coincide with implementation of the renewed MS4 Permit, scheduled for mid-2007.

- **Started the HCOC Map**

RBF Consulting was hired to develop a map of the Permit watershed area that identifies stream channel reaches where a Hydrologic Condition of Concern (HCOC) may exist. The map will assist Permittees, Regional Board, and project proponents to identify potential downstream impacts from proposed projects.

- **Applied for Grants**

The District applied for two grants under the State Water Board's Consolidated Grants Program. One grant proposal requested funds (\$600,000) for the HCOC map project, and the other requested funds (\$600,000) for the LID Guidance and Training project. We were awarded funds for the LID project, but not for the HCOC Map project.

- **Worked with UCI on Bacteria**

We continued work on the bacterial source investigation in the Cucamonga Creek watershed with Professor Stanley Grant of UC, Irvine and his graduate student Cris Surbeck. Their findings may help understand why pathogen indicator bacteria appear to grow within the channel flow itself.

- **Participation in the Stormwater Quality Standards Task Force**

The San Bernardino County Flood Control District (District), as the Principal Permittee, participated on behalf of the Permittees in the Stormwater Quality Standards Task Force. The Task Force, created to evaluate current Rec-1 beneficial use designations in the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan), includes staff from the USEPA and the Regional Board, and is assisting the Regional Board's triennial review of the Basin Plan. The Permittees are contributing substantial funding to the Task Force. Phase 1 of this effort concluded in December 2004. Phase 2 was nearly completed by June 2006, and Phase 3 was underway in late 2006. Reports and technical memoranda were prepared that document the findings.

Further information on this project, including all technical memoranda, is available at the Santa Ana Watershed Project Authority website:

<http://www.sawpa.org/projects/planning/stormwater2.htm>.

- **TMDL (Total Maximum Daily Load) Development**

- **Middle Santa Ana River Pathogen TMDL**

This TMDL includes Reach 3 of the Santa Ana River, as well as reaches of Chino Creek, Cucamonga Creek, Mill Creek near Prado, and Prado Lake Park. TMDLs for these waters were adopted by the Regional Board in August 2005 as an amendment to the Water Quality Control Plan for the Santa Ana Basin. The State Water Resources Control Board approved the TMDL on May 15, 2006. The MSAR TMDL stakeholder group has developed an Agreement and cost-share arrangement to begin TMDL Implementation tasks. In addition to the San Bernardino County Permittees, MSAR stakeholders include Riverside County, the Cities of Riverside and Corona, and the US Forest Service.

The District assisted in the preparation of a Consolidated Grant proposal for funding (\$600,000) to assist with implementation of the MSAR TMDL. The proposal was submitted by SAWPA on behalf of the MSAR TMDL Stakeholder Group, and was awarded funding. Under this grant, monitoring plans and quality assurance project plans were developed with consultant assistance, and approved by the Regional Board. Monitoring was scheduled to begin in July 2007.

- **Big Bear Lake Nutrient TMDL**

The District is participating in the Big Bear TMDL stakeholder group on behalf of the Co-Permittees, along with the City of Big Bear and the County of San Bernardino. The Regional Board adopted the TMDL for nutrients on April 21, 2006. The Big Bear TMDL stakeholder group is working on an Agreement to begin required TMDL tasks. The Big Bear Lake TMDL workgroup includes the Big Bear Municipal Water District, the City of Big Bear Lake, the US Forest Service, and Caltrans.

- **Participation in the Stormwater Monitoring Coalition**

The Permit (Monitoring and Reporting Program, Section III.6 and III.7) requires the Permittees to cooperate with the Southern California Coastal Water Research Project (SCCWRP) in regional monitoring and assessment efforts. The District participates on behalf of the Permittees in the Southern California Stormwater Monitoring Coalition (SMC) that operates in cooperation and with guidance from SCCWRP. Recent and ongoing work by the SMC includes the following:

Ongoing Studies:

- **Reference Bacteria Study**

This project is assessing natural bacteria levels in numerous streams throughout southern California in order to provide a regional characterization of background bacteria concentrations. The outcome of this study may help develop numeric targets for multiple watersheds that account for natural background levels of bacteria.

- **Building a Regionally Consistent and Integrated Freshwater Stream Bioassessment Monitoring Program**

The approach for building a regionally consistent bioassessment monitoring program has three phases, including: 1) methods standardization; 2) calibrating and validating a regional assessment tool; and 3) designing and implementing an integrated, coordinated regional monitoring program.

- **Laboratory Intercalibration**

This study builds on the previous intercalibration study that was completed in 2003, and will develop performance-based quality assurance and quality control criteria for ongoing stormwater testing throughout the region. Laboratories that wish to analyze stormwater samples on behalf of SMC member agencies in the future are required to verify that they can meet the performance-based criteria developed as part of this study.

- **LID Guidance and Training Project**

This project will assess the effectiveness of low impact development (LID) techniques for pollutant removal and hydromodification reduction for projects in southern California. This project began in December 2006 with funding from a state grant (\$600,000) and matching funds from the SMC and CASQA.

Program Evaluation (Audit)

From May through July 2006, the individual stormwater programs for the cities of Chino, Chino Hills, Colton, Grand Terrace, Highland, Loma Linda, Montclair, Ontario, Rancho Cucamonga, Rialto, San Bernardino, Upland, and Yucaipa were evaluated by staff from the Regional Board. Although the findings were specific to the evaluated Permittees, the Stormwater Program as a whole discussed the findings, and all Permittees learned more about the compliance expectations.

Most of the audited Permittees received reports and Notices of Violation from the Regional Board based on audit findings.

Planned Activities for Next Year

In addition to continued implementation of Permit requirements, the following program elements will be targeted for enhanced implementation in fiscal year 2007-08.

- **Report of Waste Discharge (ROWD) and Permit Renewal**

Although the ROWD was submitted as scheduled in October, 2006, the issuance of a draft fourth-term did not occur during the reporting year as expected. We expect to work with the Regional Board to develop the renewed MS4 Permit in 2008.

- **Review and revision of the Implementation Agreement**

The Implementation Agreement between the Permittees has been thoroughly reviewed in conjunction with the ROWD preparation and Permit renewal process. Recommended revisions are in review by the Permittees and approval of the revised Agreement is expected to coincide with the renewal of the MS4 Permit.

- **TMDL Implementation**

The MSAR TMDL Task Force will continue to meet and direct the required implementation tasks. Monitoring data will be evaluated to determine potential sources of bacteria, and verify the existing water quality of the area. The Big Bear Lake TMDL requires that a monitoring plan for the lake and a monitoring plan for the contributing watershed area be developed. These plans are expected to be submitted to the Regional Board in November, 2007, with monitoring to begin after the plans are approved.

- **Monitoring Program Improvements**

New sampling equipment was purchased in 2004 and 2005 to replace obsolete and failing samplers. The sampling sites and methodology will be in part modified and improved in fiscal year 2007-08.

- **Training**

The Training Subcommittee will work to re-implement and augment the online training program with lecture-style training, along with field-based inspector training. The

Subcommittee will explore options for collaboration on training efforts with neighboring municipal stormwater programs.

- **CASQA Participation**

The District participates in the California Stormwater Quality Association (CASQA) to further the interests of stormwater permit holders throughout the state. CASQA also works with the State Water Resources Control Board to develop and comment on stormwater policies. The District has representation on the CASQA Board of Directors and the Executive Program Committee.

Introduction

San Bernardino County's Stormwater Program (Stormwater Program) began immediately after receiving a National Pollution Discharge Elimination System (NPDES) Stormwater Permit (Permit) from the California Regional Water Quality Control Board - Santa Ana Region (Regional Board) in October 1990. The Permit named the San Bernardino County Flood Control District (District), the County of San Bernardino (unincorporated areas in the Santa Ana River Basin), and the sixteen incorporated cities in the basin as Permittees. The Permit also designated the District as Principal Permittee and the County and sixteen incorporated cities as Co-Permittees.

The Permit initially required the Permittees to implement a Drainage Area Management Program (DAMP) to minimize non-stormwater discharges to the storm drain system and reduce pollution caused by stormwater runoff to the maximum extent practicable. The DAMP was prepared in October 1993 and described the development of required program elements designed to minimize the discharge of pollutants to the storm drain system. Each Permittee is individually responsible for compliance with the Permit (local programs), although they perform several activities cooperatively or in close coordination (area wide programs).

In 1995, a Report of Waste Discharge (ROWD) was prepared. The ROWD described the progress made during the first five-year permit term and served as the application for a second permit. The Permit was renewed by the Regional Board for a second five-year term (1996-2000) in March 1996. The DAMP and ROWD were enforceable components of the second-term Permit. During the second-term, the Permittees established several programs, procedures, and policies (collectively referred to as the Municipal Stormwater Management Program (MSWMP)) designed to identify and reduce sources of stormwater pollution and water quality impairment.

On September 1, 2000, the Permittees submitted a revised ROWD to the Regional Board as the application for a third permit. On September 29, 2000, the Regional Board responded with comments that were promptly responded to by the Permittees. On March 2, 2001 the second-term permit (1996-2000) was administratively extended because the Regional Board had not yet issued a third-term permit. The administratively extended second-term permit (Order No. 96-32, NPDES Permit No. CAS618036) required the Permittees to continue implementing their stormwater program in accordance with the MSWMP. A third-term permit was issued on April 26, 2002, under Board Order No. R8-2002-0012 (NPDES Permit No. CAS618036).

On October 27, 2006, the District and the Co-Permittees submitted a revised ROWD and MSWMP, as required, to the Regional Board as application for a fourth-term permit. As of the date of this report, the Regional Board had not yet responded to this submittal. It is anticipated that the fourth-term permit will be developed and adopted in 2008.

This FY 2006-07 Annual Report presents the current status of MSWMP implementation, with an evaluation of program effectiveness for the reporting year (fiscal year July 1, 2006 to

June 30, 2007) and planned activities for the upcoming year (July 1, 2007 to June 30, 2008). (The ROWD and MSWMP supersede the DAMP for the third-term Permit.)

The tables and figures in this report were developed through an online database program that is still under development. The District, as the Principal Permittee, uses the database to analyze data and evaluate possible trends, levels of compliance, program effectiveness, and other useful program management information. The Permittees are each responsible for entering information into the database, and for submittal of required information and materials needed to comply with the Permit. The Permit also requires that these submittals be signed by a duly authorized Permittee representative under penalty of perjury (Monitoring and Reporting Program IV.3). The signatures/certifications provided by the Permittees are included in the attached CD ROM. Two Permittees had not provided the signature/certifications as of the Annual Report submittal date (although their certifications are expected to be received and their data are presented in this report as derived from the new MS4 Database).

This is the third Annual Report to rely on the new database to provide Permittee data. The online database (MS4 Database) for tracking Permit-related activities has been in development since late 2003, and was operational for data entry beginning in January 2005. There are numerous challenges in obtaining full-scale implementation of the MS4 Database, including technical and institutional issues that are yet to be fully resolved. Every attempt has been made to ensure that all Permit-required information is included, and that the data are accurate. In addition, Regional Board staff have been granted limited access to view database contents via the World Wide Web.

The following terminology is used in this report:

Principal Permittee – San Bernardino County Flood Control District

Co-Permittees – County of San Bernardino and the sixteen incorporated cities in the Santa Ana Watershed area of San Bernardino County; Cities of Big Bear Lake, Chino, Chino Hills, Colton, Fontana, Grand Terrace, Highland, Loma Linda, Montclair, Ontario, Rancho Cucamonga, Redlands, Rialto, San Bernardino, Upland, and Yucaipa.

Permittees – Principal Permittee and the Co-Permittees, collectively

Permittee abbreviations used in the report figures:

Agency	Abbr.	Agency	Abbr.
Big Bear Lake	BBL	Ontario	ONT
Chino	CHI	Rancho Cucamonga	RAC
Chino Hills	CHH	Redlands	RED
Colton	COL	Rialto	RIA
Fontana	FON	San Bernardino	SBD
Grand Terrace	GRT	San Bernardino County	SBC
Highland	HIG	SBC Flood Control	FCD
Loma Linda	LOL	Upland	UPL
Montclair	MON	Yucaipa	YUC

Section 1. Program Administration

The MSWMP requires a significant managerial commitment to oversee the implementation of traditional Best Management Practices (BMPs) that address pollution from particular activities or land uses. As these management activities are vital to the success of the MSWMP, they have been included as a program element. The Permittees evaluated the MSWMP and the existing management structure during the development of a new Report of Waste Discharge (ROWD) as application for the fourth-term Permit. The recommended revisions to the MSWMP were submitted to the Regional Board with the ROWD in October 2006.

The development of the ROWD and application for the fourth-term permit is a significant effort for the Stormwater Program. The ROWD outlines an improved approach to implementing the MSWMP and proposes that we prioritize among the various water quality problems facing the Permittees. The ROWD also recommended short-term and long-term implementation activities. Short-term activities included: implementation of the Middle Santa Ana River Bacterial Indicator TMDL, initiation of a risk-based program, continued support and implementation of the SWQSTF recommendations, evaluate metrics for program effectiveness evaluation, review the pollutants of concern and prepare strategic plans to address each one, develop a risk-based facility inspection program, and seek grant funding for strategic structural BMP implementation. Long-term activities included: establishing better cooperation among regional stormwater programs, developing regional treatment options, developing a market-based performance bond program for stormwater-related program elements, developing a model for local implementation plans, improve the transfer of “best program practices” among various programs, and established a database and inspection program for post-construction BMPs.

The ROWD also presented the following table that summarizes the key program changes proposed.

Table ES-1. Summary of Key Proposed Structural and Programmatic Changes for the San Bernardino County Area-wide MS4 Permit

No.	Proposal	Purpose/Benefit	Where/How it is addressed
1	Separate the MSWMP from the ROWD	Distinguishes permit obligations (ROWD) from specific implementation activities (MSWMP). Simplifies the permit. Increases program flexibility. Focuses compliance on outcome rather than process.	<ul style="list-style-type: none"> ■ Appendix A, ROWD – MSWMP has been revised to reflect the content of the ROWD ■ Section 9.3, MSWMP – MSWMP will continue to be updated annually as part of the annual report, or as needed to support TMDL implementation
2	TMDL implementation	Establishes TMDL implementation as a high priority during the next permit term. Shifts focus to compliance, which provides basis for re-allocation of finite program resources to meet TMDL requirements.	<ul style="list-style-type: none"> ■ Section 5.2, ROWD – Identifies TMDL implementation as a key activity during the next permit term ■ Section 9.2.5, MSWMP – Requires that the Stormwater Management Program be revised, as needed, to address TMDL study findings ■ Section 9.3., MSWMP – Performance Commitments Nos. 9-1 and 9-2 ■ Section 10.2.2, MSWMP – Recognizes commitment to monitoring to support TMDL implementation ■ Section 10.3, MSWMP – Performance Commitments 10-1 and 10-2
3	Establish risk-based inspection program	Re-allocates finite program resources in proportion to expected benefit to public health and the environment.	<ul style="list-style-type: none"> ■ Section 1.1, ROWD – Introduces risk-based concept ■ Section 5.2.2, ROWD – Introduces risk-based inspection program that will be developed early during the next permit term ■ Section 4.2.4, MSWMP – Describes risk-based prioritization ■ Section 4.3, MSWMP – Performance Commitment No. 4-1
4	Revised definitions of terms in the MS4 Permit glossary, MEP, BMP, BAT, controllable water quality factors, significant environmental impact	Essential to define expected level of effort in the absence of specific numeric permit limits. Reduces the inherent subjectivity of program compliance audits.	<ul style="list-style-type: none"> ■ Section 4.3 and Appendix C, ROWD – Recommended revised and new definitions. The permittees request that these definitions be incorporated into the glossary of the next MS4 Permit.
5	Develop formal measures of program effectiveness	Identified as a significant deficiency in the most recent round of program audits. Reinforces shift to outcome-oriented implementation strategies.	<ul style="list-style-type: none"> ■ Section 5.2.4, ROWD – Programmatic activity recommended for implementation during next permit; purpose is to establish more direct measures of program effectiveness that are tied to water quality improvements ■ Section 9.2.1, MSWMP – Recommendation to reduce or eliminate reports or reporting elements that do not serve the essential purpose of demonstrating improvements to water quality ■ Section 9.3, MSWMP – Performance Commitment No. 9-4

Table ES-1. Summary of Key Proposed Structural and Programmatic Changes for the San Bernardino County Area-wide MS4 Permit

No.	Proposal	Purpose/Benefit	Where/How it is addressed
6	Establish link to Stormwater Quality Standards Task Force (SQSTF) findings and recommendations	Allows Co-Permittees to initiate new implementation strategies without reopening the MS4 Permit. Focuses program resources on high-risk waters.	<ul style="list-style-type: none"> ■ Section 4.2, ROWD – Finding recommended for inclusion in the Findings Section of the next MS4 Permit ■ Section 5.2.3, ROWD – Recommends development of area-wide guidelines for implementing SQSTF findings ■ Section 10.2.3, MSWMP – Principal Permittee will continue to participate in basin planning activities ■ Section 10.3, MSWMP – Performance Commitments Nos. 10-1 and 10-2
7	Clarify oversight authority for schools, federal facilities/lands and other state agencies	Clarifies division of labor between co-permittees and state authorities. Improves program implementation efficiency by avoiding disputes over jurisdictional authority.	<ul style="list-style-type: none"> ■ Appendix C, ROWD, Permit Language Recommendations – Permittees recommend that a revised Finding No. 12 in the existing MS4 Permit be included as a finding in the next MS4 Permit.
8	Develop Local Implementation Plans (LIP)	Fulfills a need identified by recent audits of permittee stormwater programs.	<ul style="list-style-type: none"> ■ Sections 4.8.1, 5.3.4, ROWD – Recommends Management Committee develop a LIP model for use by permittees ■ Section 2.6, MSWMP – Performance Commitment No. 2-6
9	Establish performance bond system to increase compliance incentives and reduce enforcement costs	Develop additional compliance tool to support stormwater program implementation; also recommended by recent audits of permittee stormwater programs.	<ul style="list-style-type: none"> ■ Section 5.3.3, ROWD – Recommends that the Management Committee develop performance bond program that can serve as a model for the region; implementation of the program would be at the discretion of each permittee ■ Section 5.3, MSWMP – Performance Commitment No. 5-12
10	Develop database of post-construction BMPs	Provides means for tracking long-term responsibility and accountability for operating and maintaining BMPs.	<ul style="list-style-type: none"> ■ Section 5.3.6, ROWD – Recommends that the Management Committee develop the database ■ Section 9.3, MSWMP – Performance Commitment No. 9-6
11	Apply risk-based decision criteria to other major program elements: monitoring, BMPs, public education	Following completion of the development of a risk-based inspection program (see No. 3), risk-based decision criteria can be applied to other program areas so that these programs are also outcome-oriented and compliance-focused.	<ul style="list-style-type: none"> ■ Section 5.2.2, ROWD – Describes use of a risk-based approach for establishing priorities in various program areas. Initially, a risk-based approach will be applied to inspections; later this approach can be applied to other program elements ■ Section 8.3, MSWMP – Performance Commitments, Public Information and Participation will be evaluate annually so that program is directed towards highest priorities ■ Section 9.3, MSWMP – Performance Commitment No. 9-1, MSWMP and WQMP requirements will be reviewed and revised as needed to support TMDL requirements

Table ES-1. Summary of Key Proposed Structural and Programmatic Changes for the San Bernardino County Area-wide MS4 Permit

No.	Proposal	Purpose/Benefit	Where/How it is addressed
12	Enhance inter-agency transfer of Best Program Practices	Provide mechanism for sharing positive program elements among Co-Permittees.	<ul style="list-style-type: none"> ■ Section 5.3.5, ROWD – Recommends development of a mechanism or methodology to facilitate technical transfer of Best Program Practices ■ Section 9.3, MSWMP – Performance Commitment No.9- 5
13	Evaluate opportunities to work cooperatively with other agencies or MS4 Permit programs to create a more cost-effective program	Identify opportunities for cooperative stormwater program implementation to create a more cost-effective program, especially with regards to inspections, public information and participation and training.	<ul style="list-style-type: none"> ■ Section 5.3.1, ROWD – Recommends that the Management Committee establish a subcommittee to explore issue ■ Section 2.6, MSWMP – Performance Commitment No. 2-12
14	Develop scheduling system to reduce redundant inspection overlap with Regional Board staff	Avoid duplication of effort among agencies so that program resources are used cost-effectively.	<ul style="list-style-type: none"> ■ Section 5.2.6, ROWD – Recommends that the Management Committee work with the RWQCB to develop system that can be easily maintained and shared ■ Section 2.6, MSWMP – Performance Commitment No. 2-13.
15	Evaluate regional treatment alternatives	Evaluate opportunities for a regional approach to implementing watershed-based stormwater pollutant controls.	<ul style="list-style-type: none"> ■ Section 5.3.2, ROWD – Recommends that the Management Committee establish a subcommittee to explore issue ■ Section 2.6, MSWMP – Performance Commitment No. 2-14
16	Formalize process to identify and apply for state and federal grant funds	Increase opportunities to apply for grant funding to support increased program costs, for example, to meet TMDL implementation requirements.	<ul style="list-style-type: none"> ■ Section 5.2.7, ROWD – Recommends that the Management Committee establish a subcommittee to monitor grant opportunities and share information with permittees ■ Section 2.6, MSWMP – Performance Commitment No. 2-14
17	Revise Implementation Agreement	Clarify roles and responsibilities of Management Committee; establish more equitable cost-sharing arrangement.	<ul style="list-style-type: none"> ■ Sections 2.3.1.1, 2.3.3, ROWD – Sections describe proposed changes; draft Agreement is provided in Appendix B. Final Agreement will be established by the time a new MS4 Permit is issued. ■ Section 2.1, MSWMP – Describes the content of the Implementation Agreement ■ Section 2.6, MSWMP – Performance Commitment No. 2-4 requires that the Implementation Agreement be reviewed and revised as needed during permit term

1.1 Program Structure

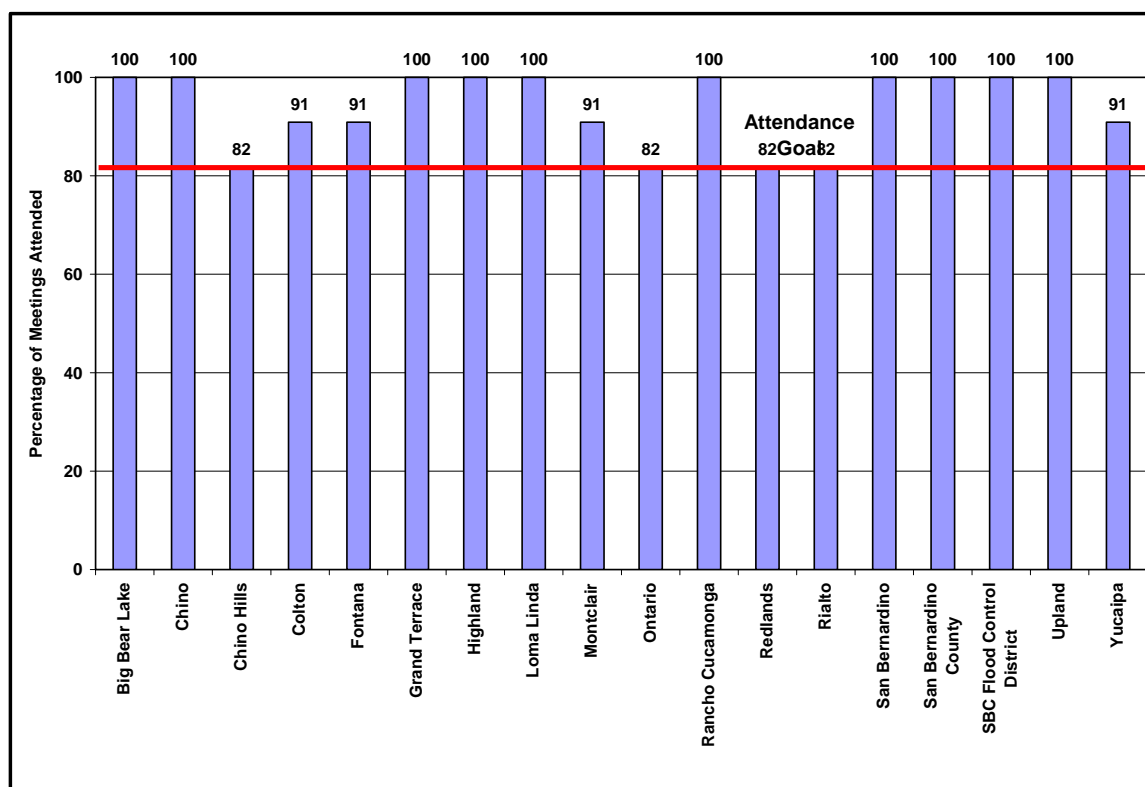
The Stormwater Program was initiated to comply with the requirements of the Municipal NPDES Stormwater permit. The Stormwater Program is comprised of the District, the County, and the Cities of Big Bear Lake, Chino, Chino Hills, Colton, Fontana, Grand Terrace, Highland, Loma Linda, Montclair, Ontario, Rancho Cucamonga, Redlands, Rialto, San Bernardino, Upland, and Yucaipa.

1.1.1 Management Committee and Subcommittees

The Permittees formed a Management Committee to manage MSWMP implementation efforts. The Management Committee is made up of one representative (typically the NPDES coordinator) from each Permittee and, in FY 2006/07, was chaired by Matt Yeager, the District's Stormwater Program Manager.

The Management Committee makes decisions that provide overall guidance throughout the permit term, and recommends implementation actions for the area-wide program to the District for execution. Subcommittees are formed to address specific program tasks, and may consist of Management Committee representatives or other Permittee staff. The subcommittees are responsible for developing program element guidelines and making recommendations for action to the Management Committee. Management Committee-approved program elements are finalized by the Principal Permittee for submittal to the Regional Board for review and approval. Once approved by the Regional Board, a program element is included within the MSWMP, and implementation by the Permittees begins.

The Management Committee meets on the third Wednesday of each month at the Principal Permittee's office. Management Committee meetings usually last two and a half hours, and are open to the public. Co-Permittee attendance is encouraged for full participation in the development of program issues, as well as for sharing local program implementation issues for the benefit of all. Also, the Permit requires each Co-Permittee to designate one representative and an alternate to the Management Committee, and to attend 9 out of the 11 (82%) scheduled meetings each year. **Figure 1.1.1** shows Management Committee meeting attendance for 2006-07.



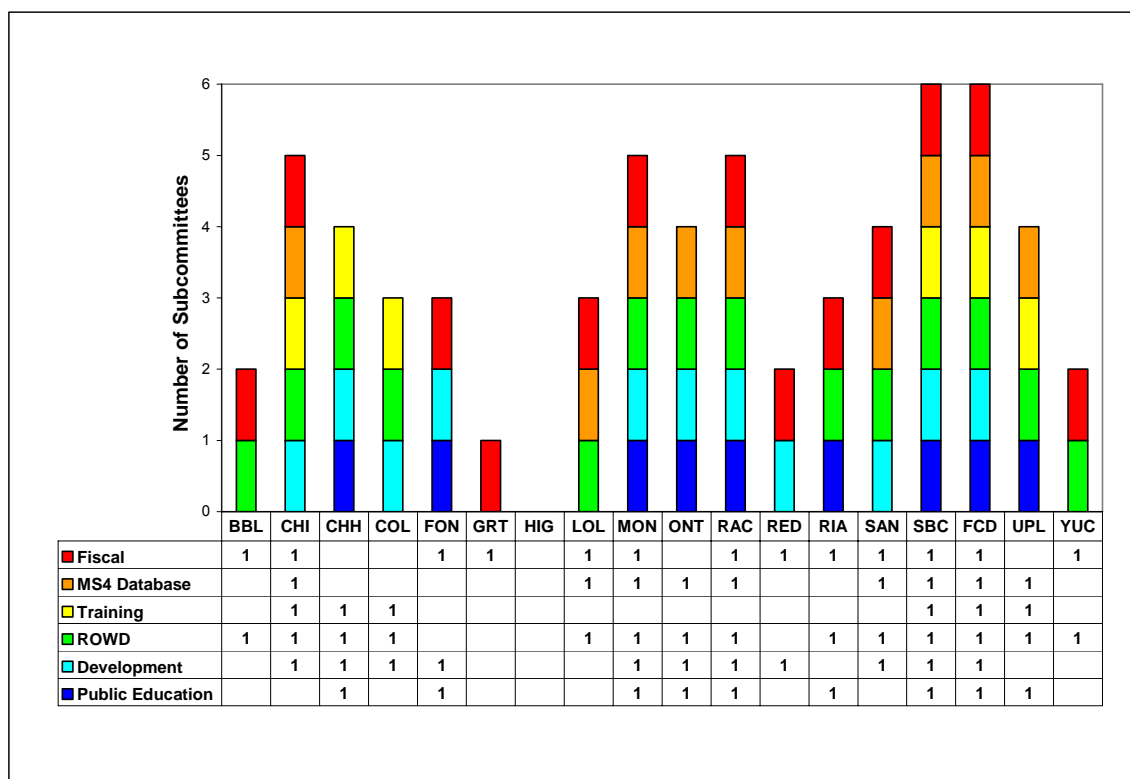
*Figure 1.1.1
Management Committee Meeting Attendance by Permittee*

This year, there were 11 total Management Committee meetings. The attendance commitment was met by all Permittees. Ten Permittees attended all 11 meetings, four Permittees attended 10 meetings, and four Permittees attended 9 meetings. This is a marked improvement over last year and indicates improved participation in the Area-wide Program.

Subcommittees are formed as needed. There are three standing subcommittees (Monitoring, Fiscal/Legal, and Public Education), two of which were active over this reporting year (Public Education and Fiscal/Legal). These standing subcommittees focus on long-term program tasks. Membership in these subcommittees is voluntary, however Permittees with expertise directly related to the subcommittee's goals are encouraged to participate. **Figure 1.1.2** shows active subcommittees that each Permittee participated in during FY 2006-07.

Ad-hoc subcommittees are formed as required to carry out focused tasks and to complete specific projects that occur on a less frequent or non-recurring basis. For this reporting year, the MS4 Database, New Development and Training ad-hoc subcommittees remained active, while the Enforcement subcommittee remained inactive. A subcommittee was formed last year to develop the ROWD as application for renewal of the Permit. Permittee representatives voluntarily serve as Subcommittee Chairs. Subcommittees were chaired by representatives from Rancho Cucamonga (MS4 Database and Public Education), the County (Training and Fiscal), San Bernardino (Fiscal), New/Redevelopment (Ontario), and the District (ROWD). Chairs for the MS4 Database and Public Education subcommittees were

changed near the end of FY 2006/07, with the District and Montclair, respectively, taking over these positions.



*Figure 1.1.2
Active Subcommittee Membership During FY 2006-07 by Permittee*

1.2 Institutional Arrangements

The Permittees entered into an Implementation Agreement dated May 4, 1992. The agreement designates the County and the Cities as Co-Permittees and the District as the Principal Permittee. This agreement defines the responsibilities of the Co-Permittees and the Principal Permittee. It also sets the funding mechanism for the area-wide programs that are administered by the Principal Permittee. Under the initial Implementation Agreement, fair share percentages for the Co-Permittees were based on the adjusted acreage of various land uses, with the Principal Permittee contributing 5%. The Implementation Agreement was thoroughly reviewed by the Permittees within the Fiscal Subcommittee and several revisions were proposed.

As reported last year, the Fiscal Subcommittee has reconsidered the fundamental assumptions for the cost share formula. The Fiscal Subcommittee evaluated possible factors (imperviousness, land use, population, etc.) to determine the best nexus to the Permit requirements for the area-wide program elements. As a result, a new cost share formula based on population, land area, and a base or equal share has been developed.

In addition, the role and authority of the Management Committee has been discussed and a more detailed description has been proposed. Timelines for administrative activities have also been modified to be more realistic. The revised Implementation Agreement has been under review by the Permittee's upper management, and the Fiscal Subcommittee will consider any comments, make revisions, and seek approval of all Permittees to finalize the revised Agreement in the next Fiscal Year. The revised Implementation Agreement was still undergoing review as of this report date.

1.3 Legal Authority

Legal authority establishes the enforcement powers of governmental agencies to take action against violators of the NPDES program. Federal regulations promulgated in November 1990 provided the legal authority to the United States Environmental Protection Agency (EPA) to mandate the program. In California, EPA has designated the State Water Resources Control Board (State Board) to enforce the program. The State Board has in turn designated the Regional Boards to issue Municipal NPDES Stormwater Permits, either individually or jurisdictionally.

1.3.1 Regulatory Authorities

General NPDES stormwater permits in California for construction activities, linear and underground projects, industrial activities, and Phase II municipal programs are issued by the State Board, with enforcement powers delegated to the Regional Boards. Phase I Municipal NPDES stormwater permits are issued and enforced by the Regional Boards. A Phase I Municipal Stormwater Permit governs this Stormwater Program. The Regional Boards may also issue individual stormwater permits to individual dischargers.

1.3.2 Stormwater Ordinance

Each Permittee has adopted a stormwater ordinance to provide legal authority to prosecute dischargers of pollutants into the storm drain system. A model storm drain ordinance was prepared by the Fiscal/Legal sub-committee, and the legal counsels of each Permittee reviewed it before being finalized. Permittees adopted individual ordinances based on the model ordinance in August 1994. The Permittees have authority to issue Notices of Violation (NOVs) to violators of stormwater ordinances as well as administrative civil liability actions or criminal prosecution. Several Permittees have revised their stormwater ordinances since 1994.

1.4 Fiscal Analysis

Prior to promulgation of the NPDES regulations, the Permittees had existing programs in place (including BMP implementation) which complement the NPDES program by reducing the potential for pollutants to enter the storm drain system. These existing programs include street sweeping, hazardous waste collection, recycling, storm drain maintenance, and others. The ROWD, finalized in September 2002, describes these BMPs with an analysis to determine adequacy, or if they are in need of improvement. Permittees have evaluated these BMPs for their effectiveness in protecting beneficial uses, and continue to implement these programs. Budgets are prepared annually for these programs. Previous Annual Reports

included Program Total costs (see Figure 1.4.1 from 2005-06 Annual Report), but the Permit does not specifically require this information to be reported. In addition, Permittees budget for participation in area-wide programs, which are implemented in cooperation with the Principal Permittee. **Figure 1.4.1** shows expenditures for the previous fiscal year, budgeted amounts for the current reporting year, and estimated budget amounts for next fiscal year, for selected program elements. The reported amounts include actual, budgeted, and estimated costs incurred by the Permittees to implement agency-specific program elements identified in the DAMP and amended in the 2001 ROWD (e.g., illicit connections/illegal discharges, industrial/commercial inspection, etc.), as well as area-wide costs (e.g., public education, monitoring program, etc.). Some programs began before the first permit was issued, and other programs were added over the course of the three permit terms. One of the largest costs is for municipal maintenance activities (note that Figure 1.4.1 has a log scale on the Y-axis).

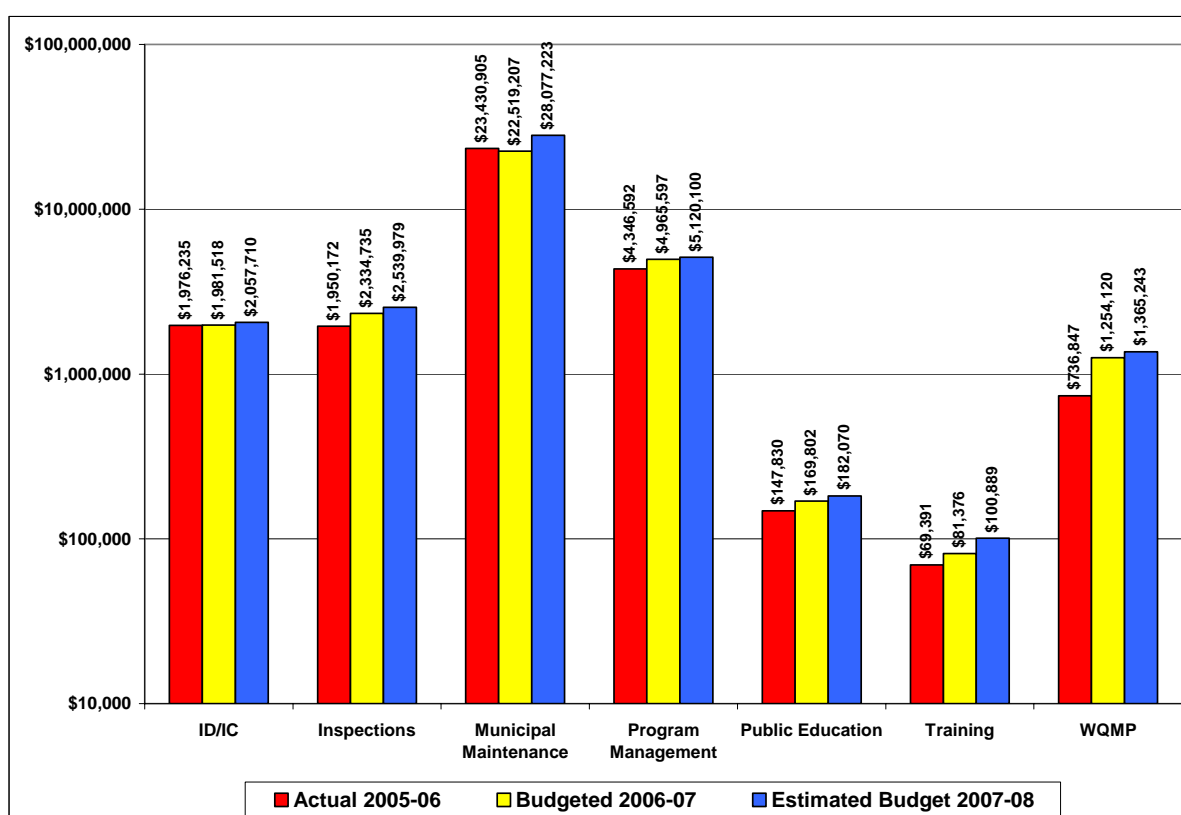


Figure 1.4.1
Fiscal Summary by Program Element

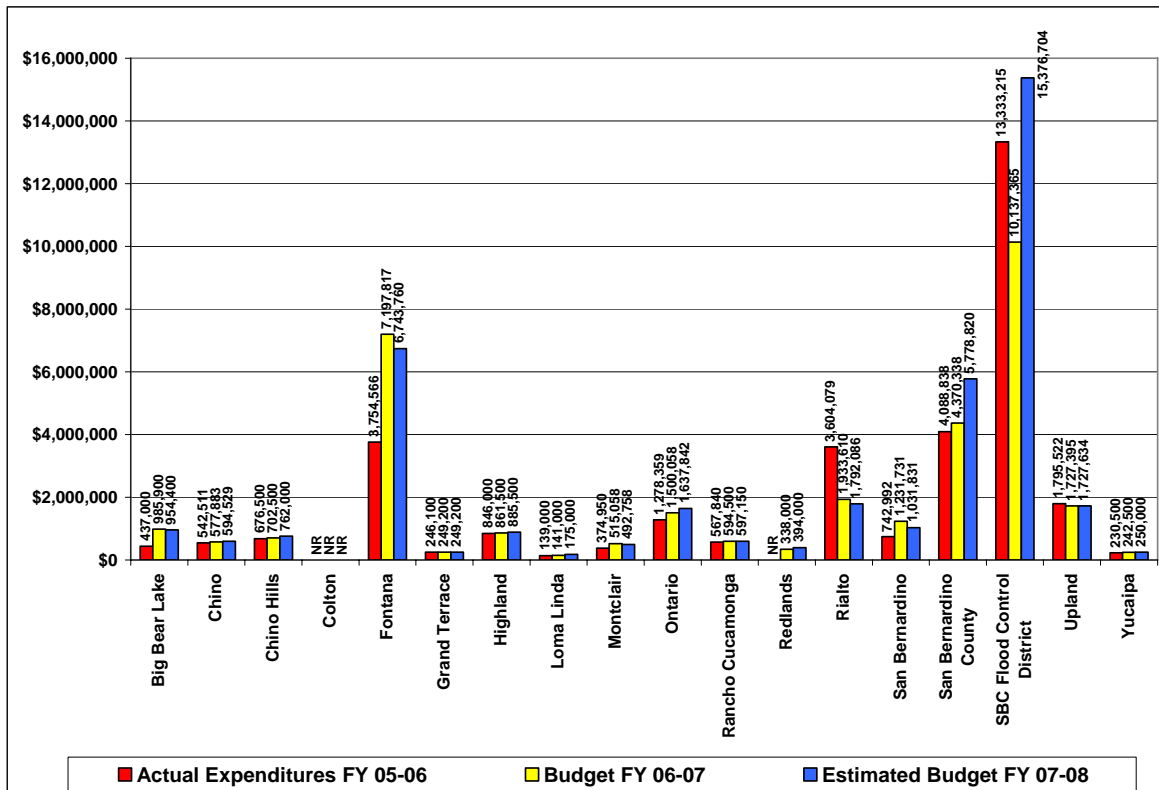
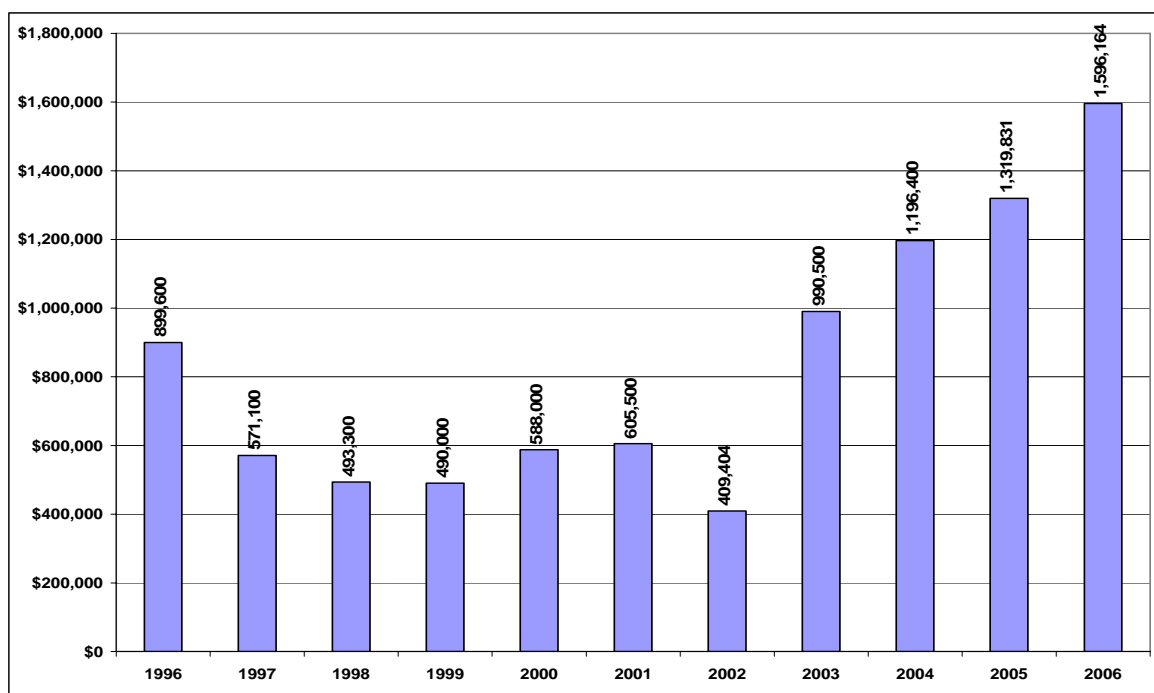


Figure 1.4.2
Fiscal Summary by Permittee

Figure 1.4.2 shows the total expenditures to implement programs and conduct activities explicitly required by the Permit and directly related to the Permit requirements. Figure 1.4.2 also shows the budget for these activities for the current fiscal year (2006-07) and the estimated budget for next fiscal year.

The Management Committee approved a budget of \$1,870,000 to implement area-wide programs for FY 2006-2007. This amount included a Public Education Program budget of \$454,000, \$156,000 for MS4 Database development, \$85,000 for the Monitoring Program, and \$150,000 for Principal Permittee administration.

The actual amount spent on area-wide programs in the previous year (FY 2005-06) was approximately \$1,596,000, as shown in **Figure 1.4.3**. This included all expenditures for the area-wide programs by the District.



*Figure 1.4.3
Area-Wide Program Expenditures by Reporting Year*

Figure 1.4.4 shows the expenditure amounts for FY2005-06, and the approved budget for FY2006-07, and the proposed budget for FY2007-08. This allows a comparison of cost allocations versus expenditures and an evaluation of budget changes between years. Budget items such as the MS4 Database development and the Water Quality Standards Task Force have decreased, while the budgets for TMDLs, HCOC Map, and the ROWD/Permit Renewal have increased for FY2006-07.

The payment of permit fees has been shifted from the area-wide program to individual Permittees due to a significant fee increase and a new fee assessment schedule. The distribution of the area-wide 2006-07 budget is shown in **Figure 1.4.5**.

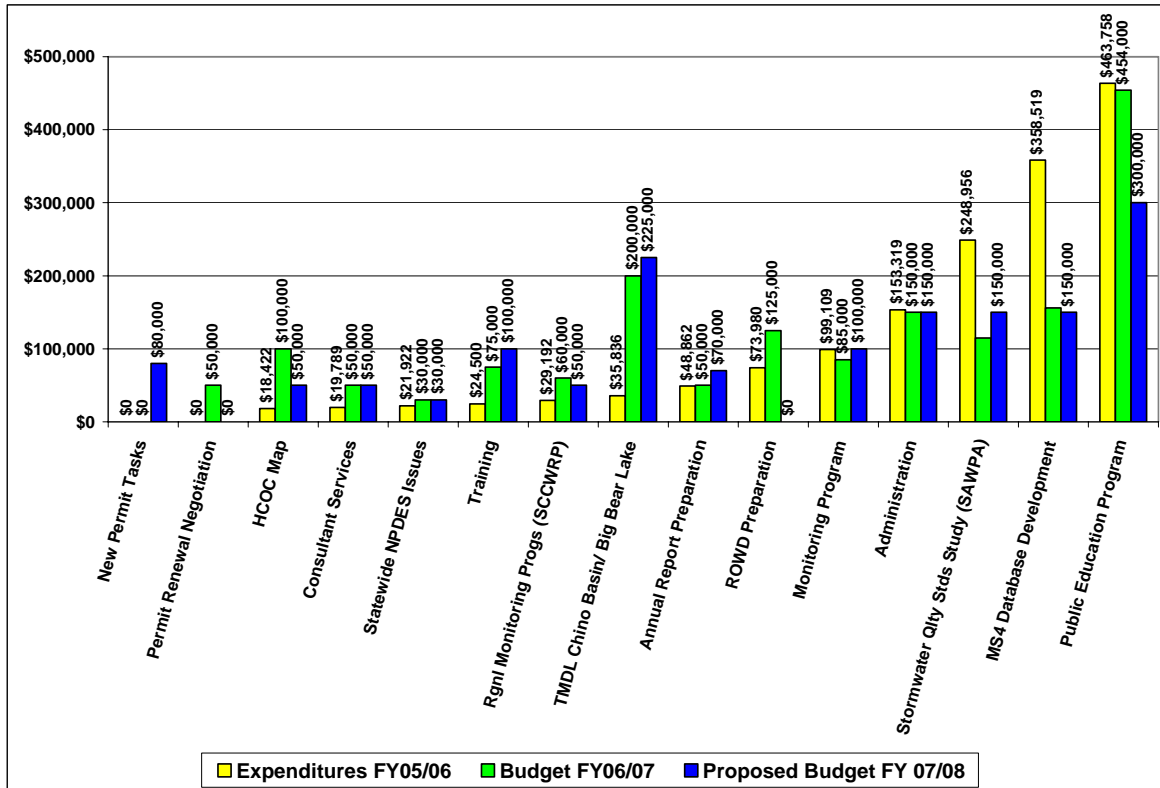


Figure 1.4.4
Comparison of Area-Wide Program Budget and Expenditures FY 05-06 & FY 06-07 with FY 07-08 Budget by Category

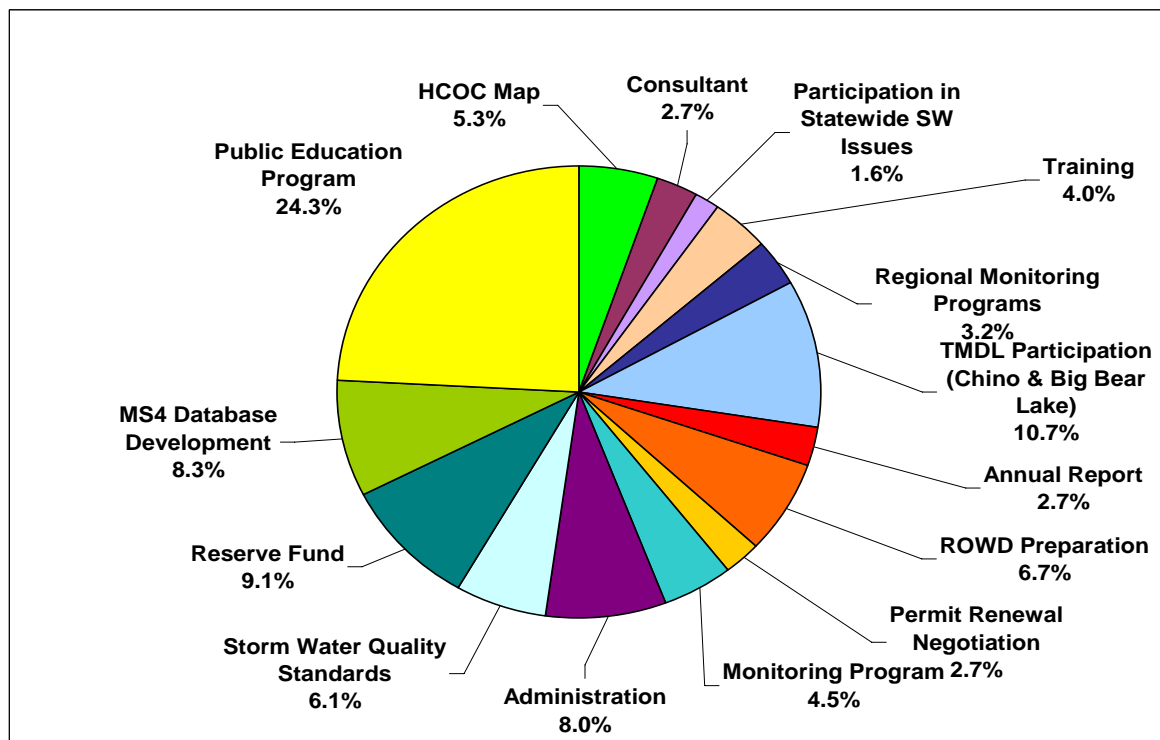


Figure 1.4.5
Cost Distribution for the FY 06-07 Budget

Funding sources for individual Permittees are listed in Table 1-1.

Table 1-1: Funding Sources for Individual Permittees

Agency	Funding Source
Big Bear Lake	General Funds, Capital Funds and Refuse Funds
Chino	Storm drain fees, inspection fees and WQMP check fees.
Chino Hills	Development Fees, General Fund, Sewer Fund
Colton	Stormwater Management Fee and General Fund
Fontana	Environmental 4002101; Solid Waste 4013282; HHW 4006101; Pretreatment 4019701; B&S 3102101; Land Development 3204101; Construction Inspection 323101; Storm Drain Maintenance 4004101; Used Oil Program 446381, 4410381; Street Sweeping 4002101; WQMP 4103125
Grand Terrace	General Fund, Sewer Fund, and Licensing Fees.
Highland	General Fund, Benefit Assessment Districts, Solid Waste, Household Hazardous Waste Fee
Loma Linda	General Fund
Montclair	General Fund
Ontario	Stormwater Pollution Abatement Fees, General Fund, Developer Plan Check Fees, NPDES Construction Inspection Fees, Business License Fees
Rancho Cucamonga	General Fund
Redlands	General Fund
Rialto	General Fund, Development Impact Fees, Oil Block Grant, Internal Service Funds, Enterprise Funds, and Gas Tax
San Bernardino	Utility Tax and General Fund
San Bernardino County	Flood Control Tax and County General Fund
SBC Flood Control District	Property Taxes
Upland	General fund, Developer Fees, Sewer Fund, Storm Drain Development Fund, Solid Waste Fund, & Other
Yucaipa	General Fund

For FY 2007-08, the Permittees approved a budget of \$1,735,500 to implement area wide program elements. The budget includes:

Public Education Program	300,000
MS4 Database Development*	150,000
Storm Water Quality Standards Study-Phase 3 (SAWPA)	150,000
Monitoring Program	100,000
Administration	150,000
New Permit Requirements	80,000
Participation in Regional Monitoring Programs	50,000
Participation in TMDL for Chino Basin & Big Bear Lake	225,000
Annual Report Preparation	70,000
Consultant Costs	50,000
Training**	100,000
HCOC Map and Documentation	50,000
Participation in Statewide Storm Water Issues	30,000
Reserve Fund (10%)	230,500
Total Budget	1,735,500

1.5 Grant Proposal Submittal

The District prepared and submitted two concept proposals in February 2006, and two full proposals in June 2006 to the State Consolidated Grants Program. One proposal was for funding to extend the HCOC Map Project to the entire watershed, to include all environmental designations, and to make the map available via the World Wide Web. The other proposal was to provide funding for a project to evaluate Low Impact Development techniques and their applicability in southern California, and develop training materials and conduct several training workshops. Finally, the District is a cooperating entity in a proposal that was submitted by the Santa Ana Watershed Project Authority that will help fund a bacterial source investigation and monitoring plan as required by the Middle Santa Ana River Total Maximum Daily Load (MSAR TMDL). The proposals for the LID project and the MSAR TMDL project were awarded funding in late 2006.

The LID Project will develop a comprehensive program to incorporate Low Impact Development (LID) strategies and techniques into the planning and design of public and private sector projects. The LID Project will develop a model program for localities in California that are interested in adopting LID strategies and techniques. It will rely on strategies and techniques to incorporate LID into resource protection and regulatory programs that have been proven by communities and institutions across the country. This will include determining the key technical and institutional issues that must be addressed for successful implementation, pilot projects that demonstrate the effectiveness of LID, and training and outreach to help solidify an implementation strategy to ensure large-scale and long-term success. The project is being conducted through a partnership that includes the Stormwater Monitoring Coalition (SMC) and the California Stormwater Quality Association (CASQA).

The MSAR TMDL project will more accurately characterize pathogen pollution in the impaired waters described in the TMDL. Importantly, the project proposes to differentiate the sources of the bacterial indicators as either human or non-human in origin.

It will also implement a best management practice (BMP) pilot study to determine the effectiveness of selected BMPs in reducing the concentrations of bacterial indicators in runoff. The results of the pilot BMP study, the pathogen characterization work and other information will be evaluated to develop a BMP control strategy and prioritization plan for the area. The project will also prepare and distribute materials to increase public awareness of the problem and how to reduce it.

Section 2. Program Status

This section of the Annual Report presents a status review of the FY 2006-07 Stormwater Program. Each subsection discusses a specific program element (e.g., Illegal Discharge Program, Industrial and Commercial Sources Program, etc.) and includes a summary of major activities accomplished this reporting year.

2.1 MS4 Solution Database

The MS4 Database Subcommittee and the Consultant (CDM) continued to develop and refine the new database. The database became functional in January 2005 and the Permittees now enter data online. The MS4 Database facilitates tracking and reporting of all Stormwater Program activities, including inspections, municipal activities, outreach and fiscal data. The MS4 Database is available to all Permittees via the World Wide Web, and has the capability for inspection data to be entered in real time using mobile data devices. The Stormwater Program has granted limited access to Regional Board staff for review of permittee data. Configuration and implementation of the CityWorks® municipal work management software was begun in late 2005. Although it was anticipated to have this program partially operational by early 2007, it has been delayed due to a delayed release of the required ESRI GIS software, and by the need to purchase and configure the needed hardware. Barring further delays, CityWorks® should be operational by March or April 2008.

2.2 New Program Staff

The Stormwater Program benefited this reporting year from the hiring of several new permanent staff. Highland, Montclair, Redlands, Rialto, and San Bernardino have each hired additional staff for NPDES implementation.

2.3 Illegal Discharge Program

There are two components of the Illegal Discharge Program: illicit connections and illegal discharges. Permittees have committed to survey all publicly maintained inlets, open channels and basins once each permit year, identify permitted connections, and eliminate or permit any illicit connections. Through the storm drain connection permit process, Permittees can better monitor and control the quality of discharges entering the storm drain system. Permittees are also required to establish a surveillance strategy and mechanism for responding to reports of illegal discharges.

2.3.1 Illicit Connections

Reconnaissance surveys for illicit connections, which had been ongoing from FY 1992-93, were completed during FY 1996-97. Initial inspections of all drainage facilities (above and below ground) were completed for the permit area. The surveys were performed by field inspecting or videotaping approximately 642 miles of facilities (including underground facilities), identifying all connections, and cross referencing the connections with as-built plans and existing permits. A total of 1,947 undocumented connections were identified

during the initial reconnaissance survey. All 1,947 undocumented connections identified during the initial survey were resolved, either through removal or permitting.

The Permittees reported a total of approximately 845 miles of facilities (including underground facilities) in the MS4 Database this year. When new facilities are constructed, inspections are conducted to make sure that all connections are permitted and authorized. The figures below reflect the best available estimates of percentages inspected and cleaned for open channels and underground drains.

Permittees continue to monitor for new illicit connections through routine inspections performed as a part of maintenance activities. In addition, illicit connections are difficult to establish because they require entry and/or construction in the public right-of-way. Permittee staff are trained to observe these activities, and to report inappropriate construction to their respective NPDES Coordinator for action. Based on the level of inspections performed in previous years and the minimal number of undocumented connections found, complete inspections on an annual basis are not deemed to be necessary. The Permit (Section XIV.9) requires Permittees to inspect all inlets, open channels and basins once each reporting year, to maintain at least 80% of the drainage facilities each year, and to maintain 100% within a 2-year period. Underground facilities are not subject to these inspection/maintenance requirements.

The Permit requirement to “maintain” the drainage facilities is difficult for the Permittees to document within the stormwater program. Permittee’s operations and maintenance staff spend significant resources to ensure that the drainage facilities are functional and in good repair. However, the term “maintenance” as used in the MS4 Permit presumably means that these facilities need to be cleaned as specified, when 25% full or more, etc. The problem in reporting this information comes when facilities have been duly inspected, but were not 25% full, or otherwise in need of cleaning. In these cases, the inspection alone meets the apparent intent of the Permit. However, since no action was warranted, it appears to be somewhat inaccurate to state that they were “maintained.” Therefore, we suggest that the requirement to “maintain” 80-100% of these facilities within the given time frames should be restated in terms of inspection requirements and documentation of whether cleaning was necessary. A cleaning requirement could then be applied to those facilities where inspections showed cleaning was required. In the meantime, we presume that all inspected facilities were cleaned if needed.

Figures 2.3.1 to 2.3.4 show the percentage of open channel, underground storm drain, inlet (catch basin), and basins inspected and cleaned during this reporting year, by Permittee.

Figure 2.3.1 shows that 12 Permittees inspected 100% of open channels and four Permittees inspected 5% or less. **Figure 2.3.1** also shows that 8 Permittees cleaned 100%, five Permittees cleaned 50 - 75%, two cleaned 2 – 25% of these facilities, and three reported that no channels were cleaned. One Permittee reported that they had no open channels.

Figure 2.3.2 shows that five Permittees inspected 100% of underground storm drains, (the Permittees have determined that inspections of underground facilities are not needed annually), and the rest inspected 45% or less. Three Permittees cleaned 100% of their underground storm drains, two cleaned 50%, while the others reported cleaning from 0% to 20% of these facilities. **Figure 2.3.3** shows that eleven Permittees inspected 100% of their

storm drain inlets; four inspected 90 - 98%; one inspected 50%; one 27%, and one 0%. Six Permittees reported cleaning 100% of their inlets, five reported cleaning 65-90%, five reported cleaning between 68% and 80%, and six reported cleaning from 0-19%.

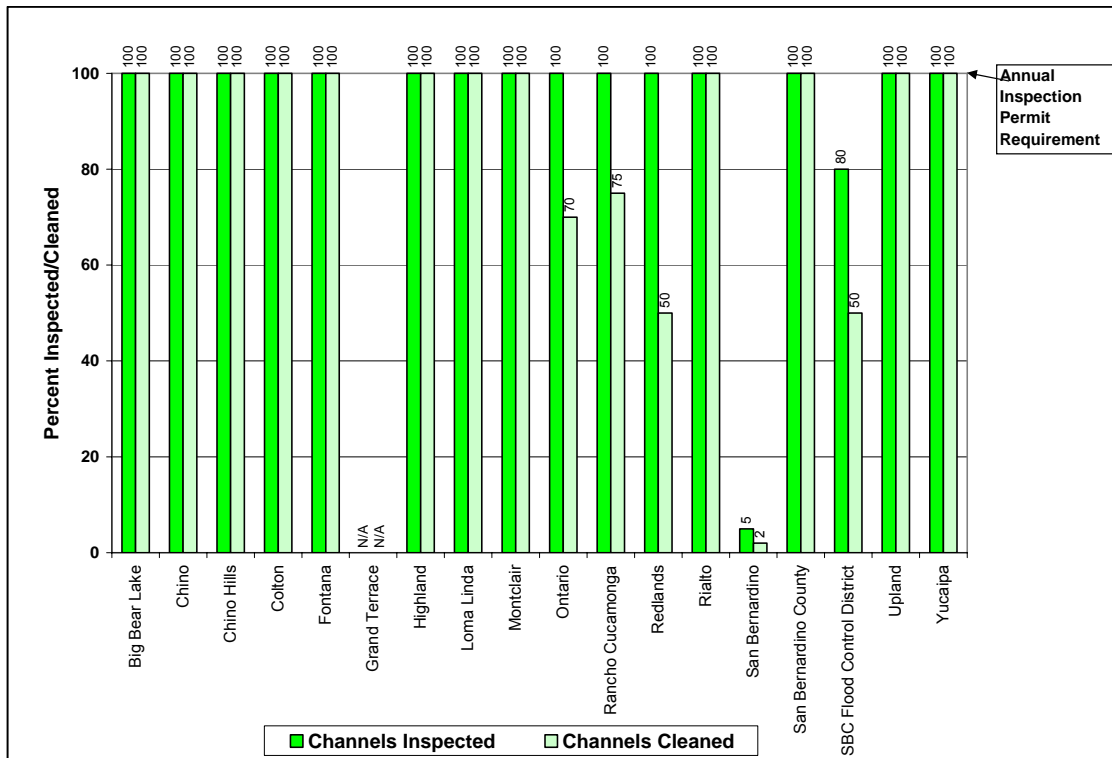


Figure 2.3.1
Percentage of Open Channels Inspected and Cleaned in FY 2006-07

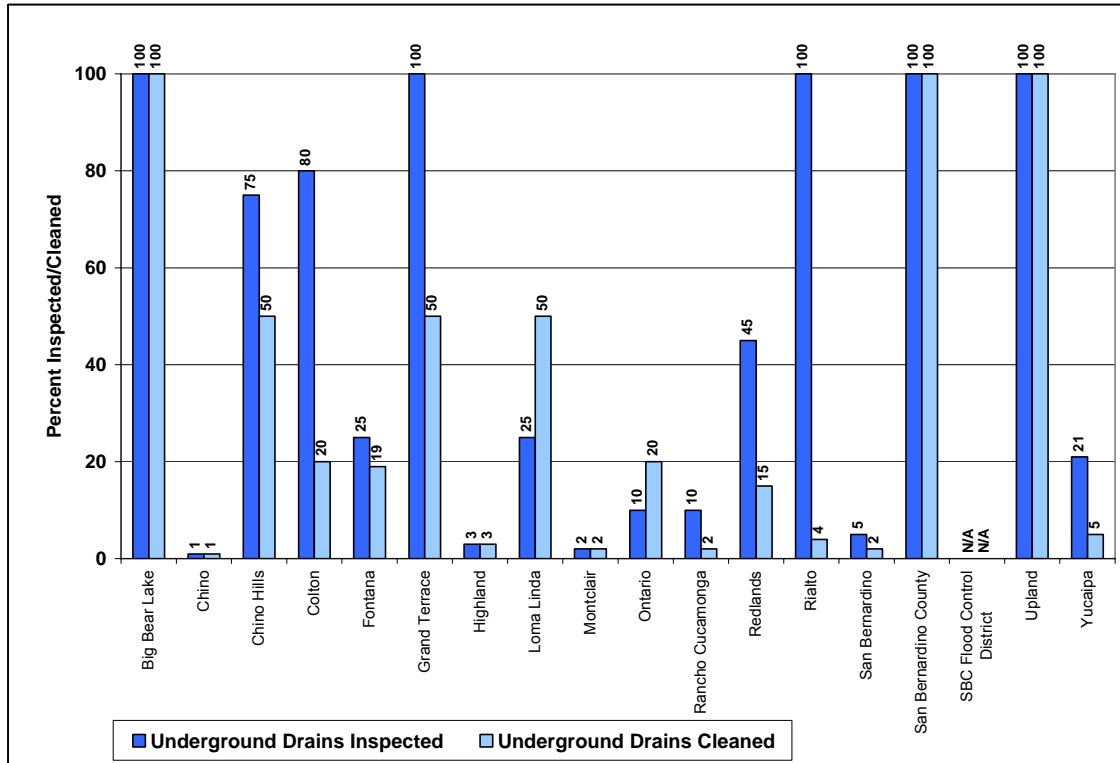


Figure 2.3.2
Percentage of Underground Storm Drains Inspected and Cleaned in FY 2006-07

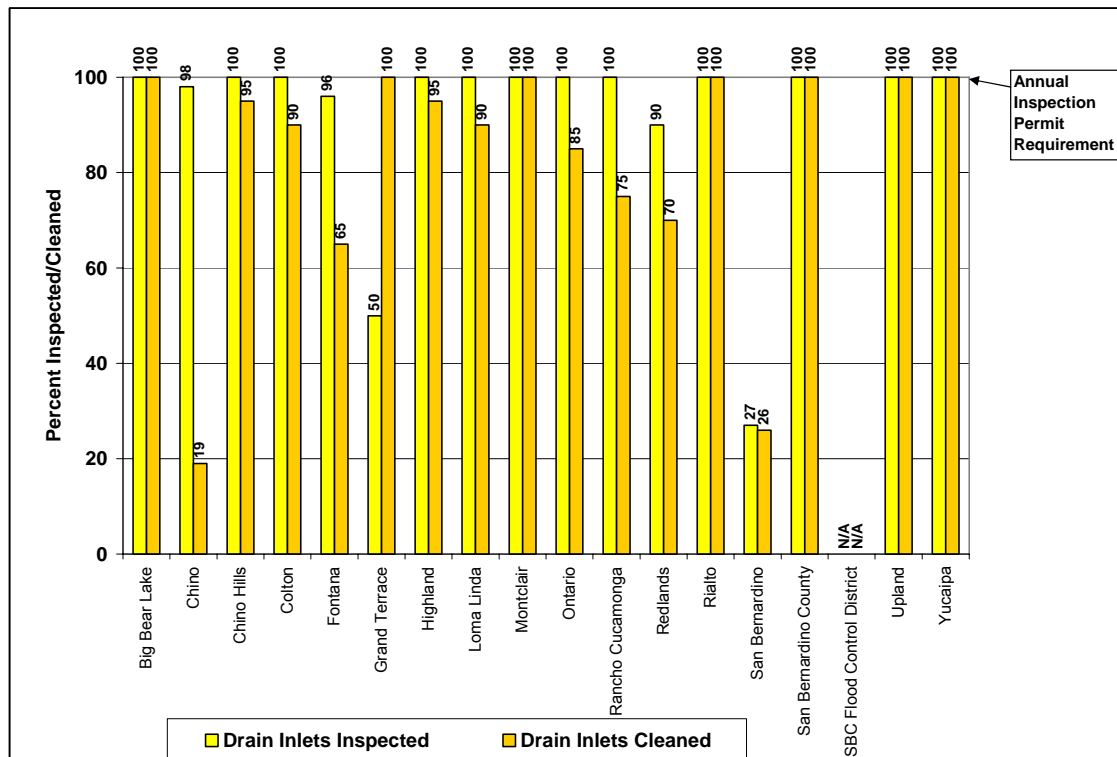


Figure 2.3.3
Percentage of Storm Drain Inlets Inspected and Cleaned in FY 2006-07

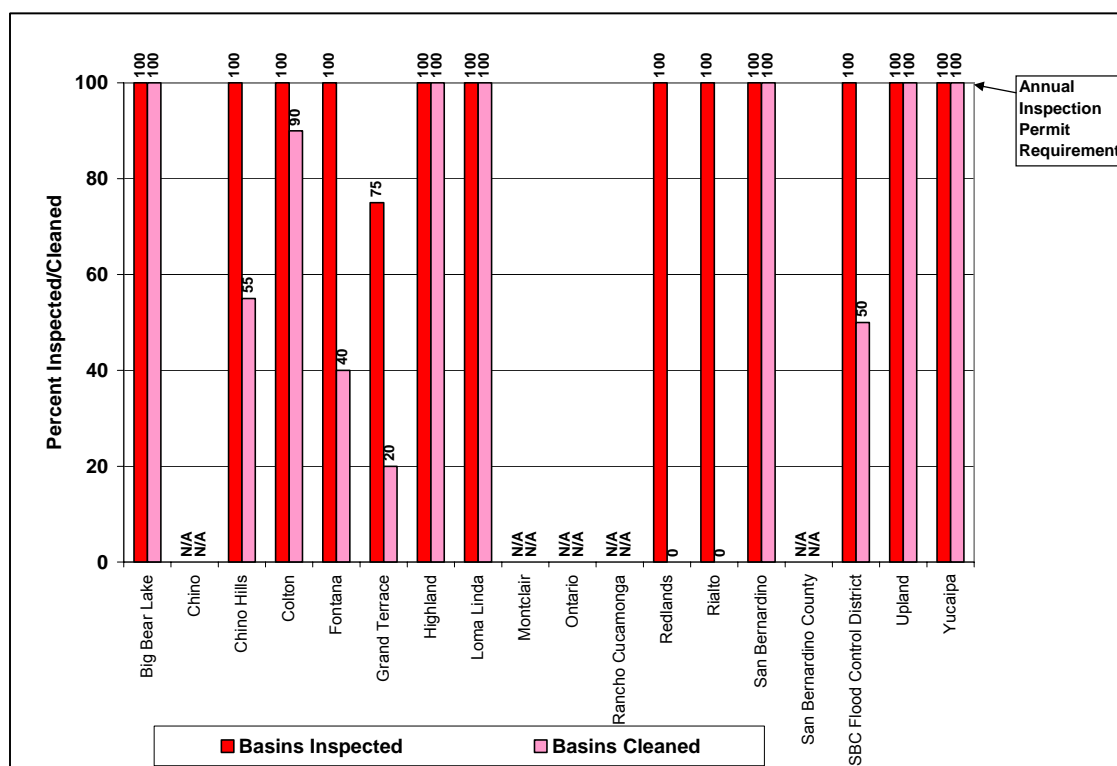


Figure 2.3.4
Percentage of Debris/Detention Basins Inspected and Cleaned in FY 2006-07

Figure 2.3.4 shows that eight Permittees inspected 100% of their debris and detention basins, one Permittee inspected 75%, six inspected 1% or less, and three report no basins in their jurisdiction. Three Permittees reported cleaning 100% of their basins, four reported cleaning from 5 – 50%, and five reported cleaning 0%.

In an area-wide comparison by facility type, **Figure 2.3.5** shows that the highest level of inspection is for “open” facilities such as detention basins, inlets, and channels, where illicit connections are easier to establish, but also easy to locate and abate. It also compares the level of inspection between previous reporting years and this year. It should be noted that the percentages for FY 1995-96 (1996 reporting year) are cumulative figures from FY 1992-93 to FY 1995-96. Natural watercourses and culvert crossings in the City of Big Bear Lake are inspected and cleaned annually before the winter season.

Figure 2.3.6 summarizes the percent of drainage facilities cleaned by Permit year. With the exception of basins, there were generally fewer facilities cleaned this year compared to last.

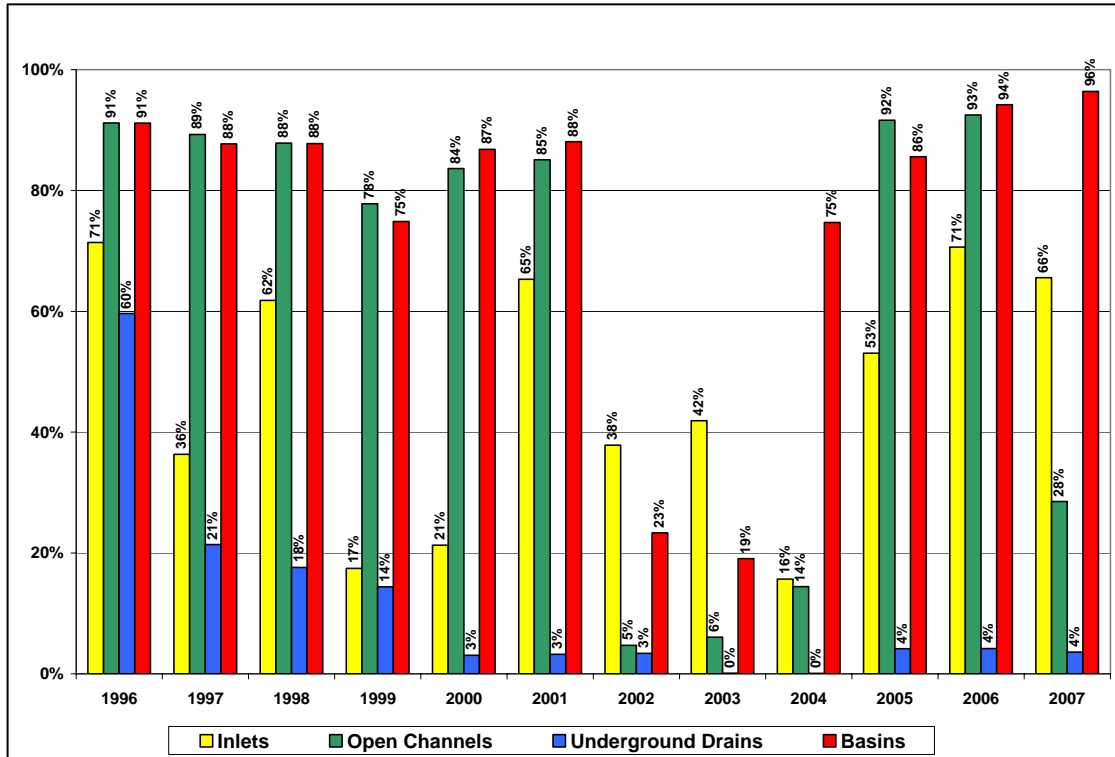


Figure 2.3.5
Percentage of Area-Wide Drainage Facilities Inspected by Reporting Year

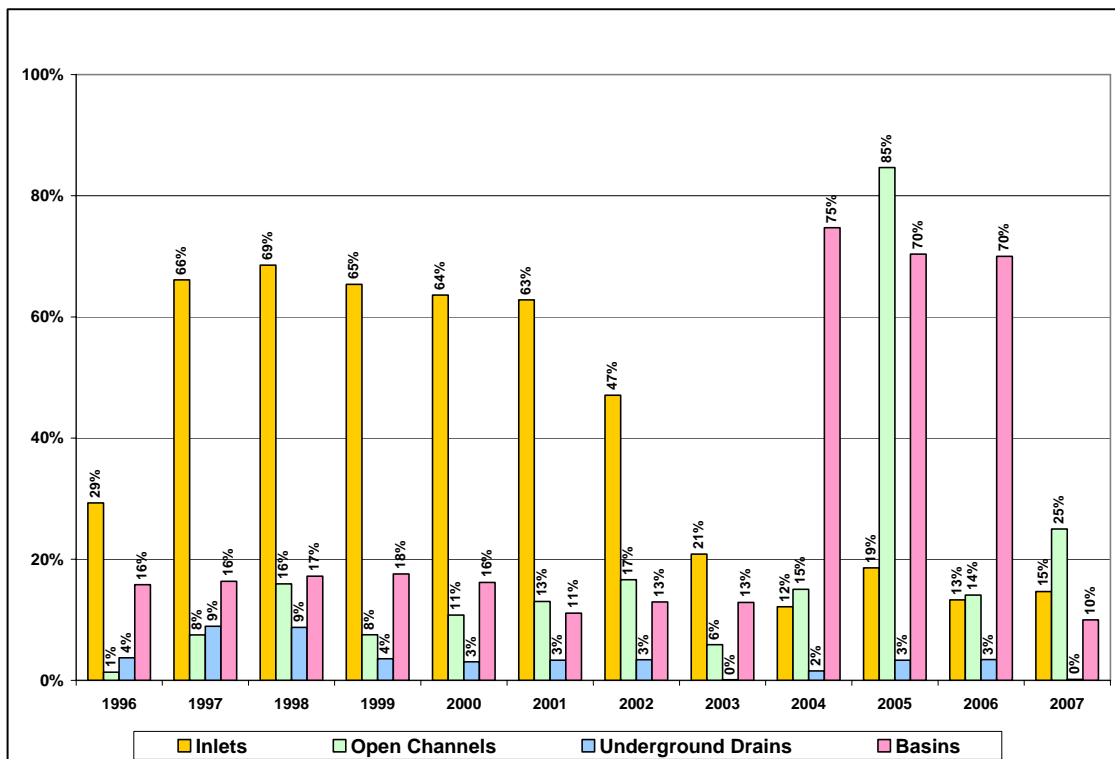


Figure 2.3.6
Percentage of Drainage Facilities Cleaned by Reporting Year

2.3.2 Illegal Activities

The Permittees have developed a program for reporting and responding to notifications of illegal discharges, spills, and dumping. Notifications of illegal discharges are reported by other agencies, the public, police departments, fire departments, maintenance workers, and through the inspection program. Percentages by reporting source are shown in **Figure 2.3.7**. This year there were significantly greater reportings from Police/Sheriff Departments and private parties. Due to new reporting forms in the MS4 Database, there is a large category labeled “other,” which includes reports from private parties, spill hotline, and other agencies. These “other” reporting sources will be further described in future reports if possible.

Several Permittees participate in the San Bernardino County Environmental Crimes Task Force. The Task Force pursues and coordinates enforcement of illegal discharges and dumping with multiple involved agencies, including San Bernardino County District Attorney’s office, California Department of Fish & Game, EPA, and the Regional Board.

Figure 2.3.8 shows the proportion of spills, debris dumping, sewage discharges, and illegal discharges for FY 2006-07. These categories have been modified since FY 2003-04, due to the implementation of the MS4 Database, but the proportions of spills and discharge each year have been roughly similar. This year there were a higher proportion of “dumping” events and fewer “spill” events than in FY2005-06. Reports of illegal discharges, spills and dumping are immediately responded to and documented. Reports of illegal discharges are electronically and consistently stored for documentation and ease of access. When fully operational, the MS4 Database will serve as a comprehensive database for these incidents for all Permittees. Several Permittees are still transitioning to the full use of the MS4 Database, and may document illegal discharge/dumping/spill events separately. The attached CD ROM contains any such supplemental data that was submitted by the Permittees. As shown in **Figure 2.3.9**, the number of events per year generally increased between 1996 and 2001, with a high of 385 in 2001.

Figure 2.3.10 shows the types of enforcement actions used by the Permittees to address illegal discharges/spills/dumping in FY 2006-07. Approximately 63% of the events required no enforcement, or were handled with verbal enforcement and education. Approximately 26% of the events warranted higher levels of enforcement including Notices of Correction, Notices of Violation, clean up costs, referral to the Regional Board or stop-work orders. The large group labeled “not reported” includes cases that were referred to other agencies, cases where follow-up may be pending, and numerous cases which did not require follow-up. The illegal discharge reporting portion of MS4 Database is being revised to include these follow-up types.

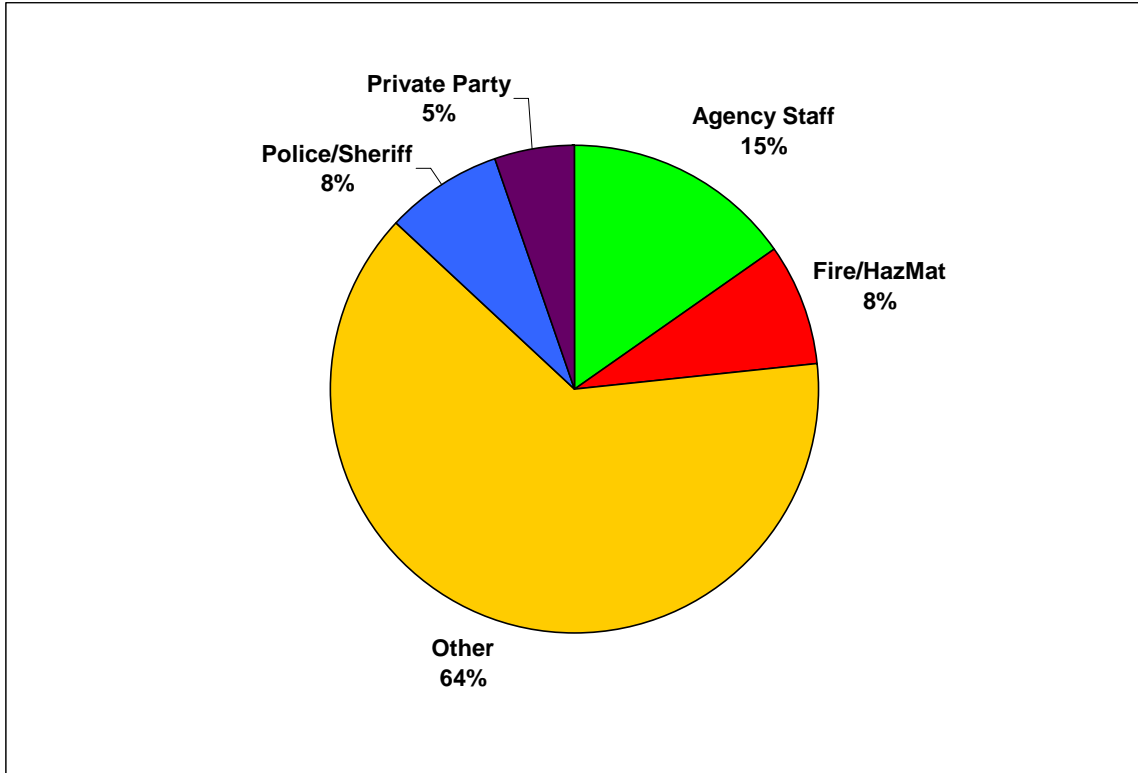


Figure 2.3.7
Area-Wide Summary of Reporting Sources for Illegal Discharge/Dumping/Spill Events

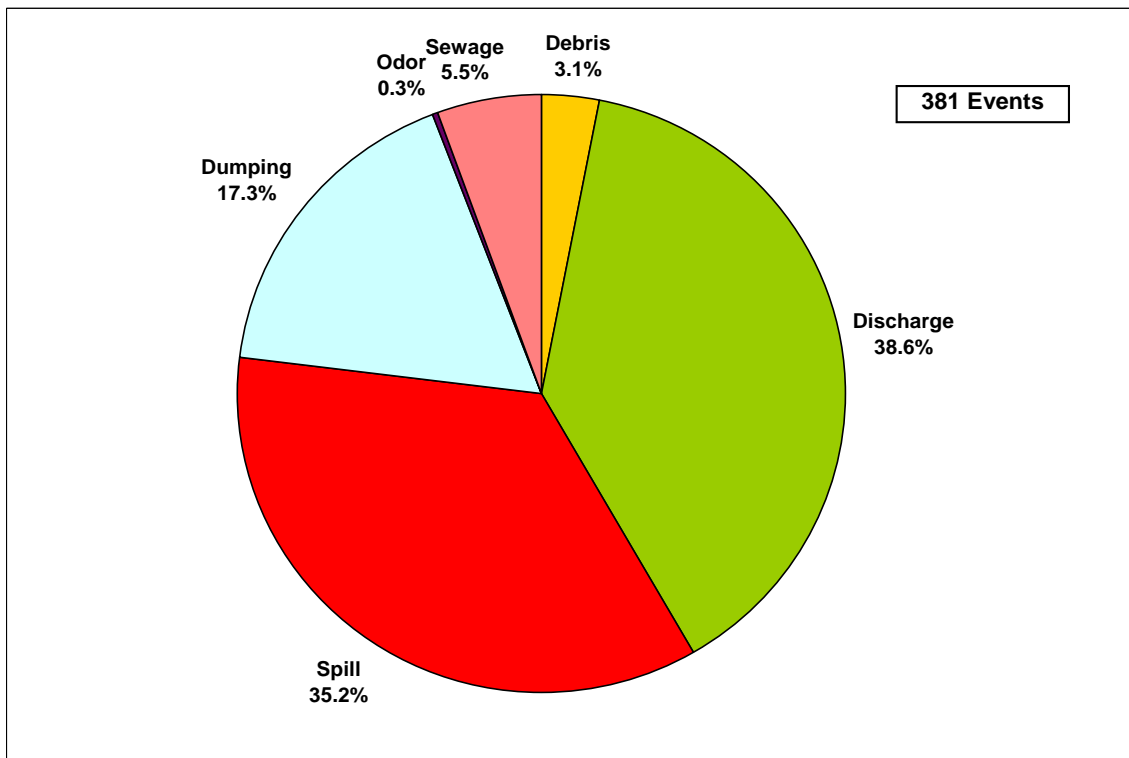


Figure 2.3.8
Types of Area-Wide Illegal Discharge/Dumping/Spill Events

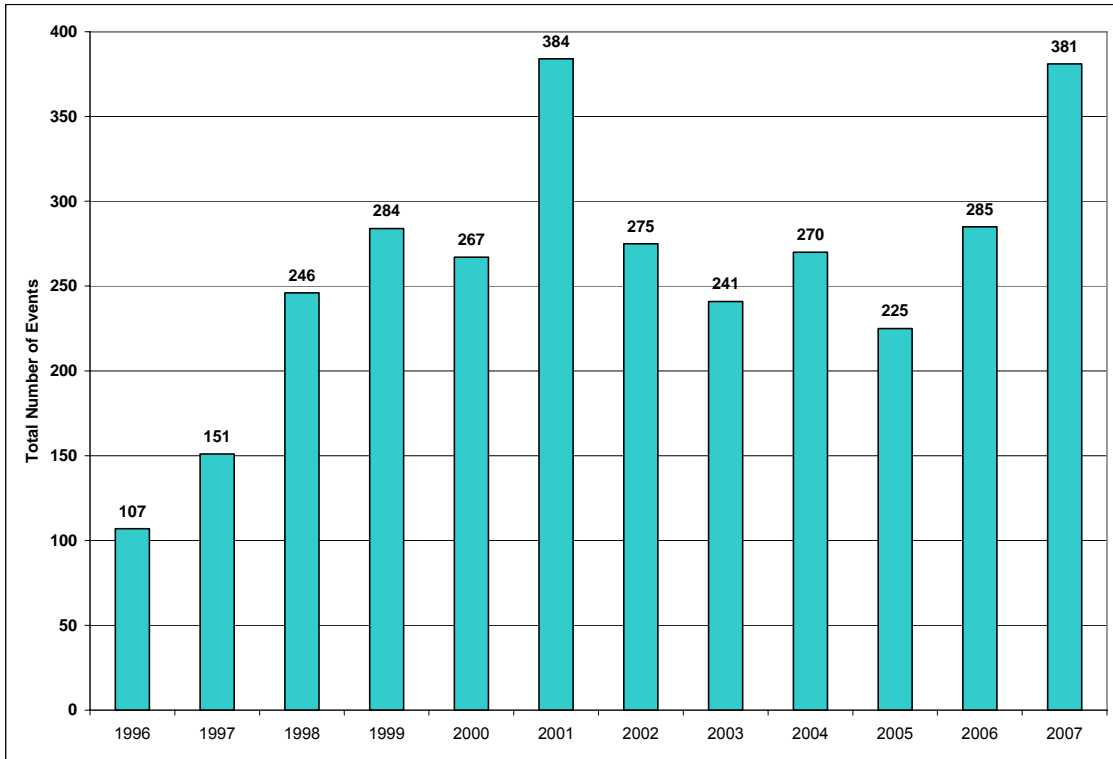


Figure 2.3.9
Total Area-Wide Illegal Discharge/Dumping/Spill Events by Reporting Year

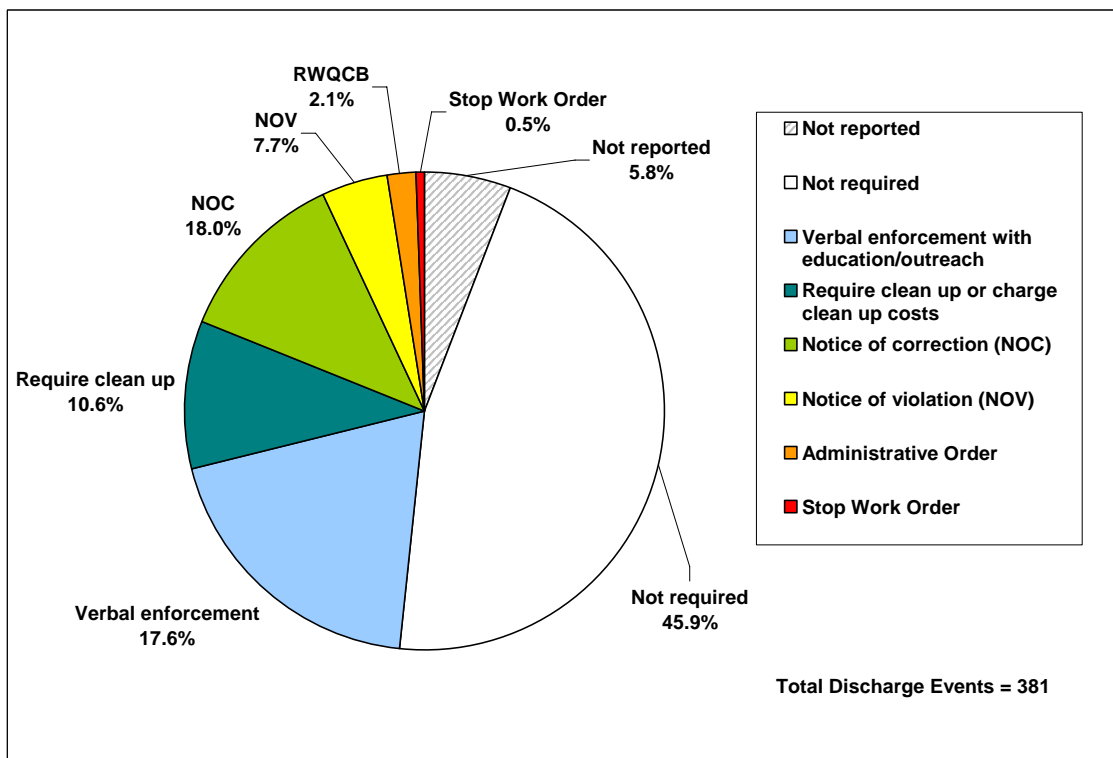


Figure 2.3.10
Area-Wide Makeup of Illegal Discharge Enforcement Types

2.4 Programs for Industrial and Commercial Sources

During FY 1996-97, the Co-Permittees determined the total number of industrial and commercial businesses using available information. The initial effort was to obtain the list of businesses from the licensing process or some similar process. They have since been screening the list to determine which businesses, based on the Standard Industrial Classification (SIC) codes, have the potential to discharge pollutants to the storm drain system. Under the third-term permit, the Permittees were required to develop inventories of commercial and industrial facilities in their jurisdictions by July 1, 2003. The facilities in these inventories were required to be prioritized and an inspection schedule established based on the prioritization. In FY 2006/07 the 17 Co-Permittees reported 10,717 commercial businesses, 2,210 non-General-Permitted and 430 General-Permitted industrial facilities (the Principal Permittee does not have businesses). The ratio of the number of businesses inspected to the total number of facilities varies considerably among Permittees.

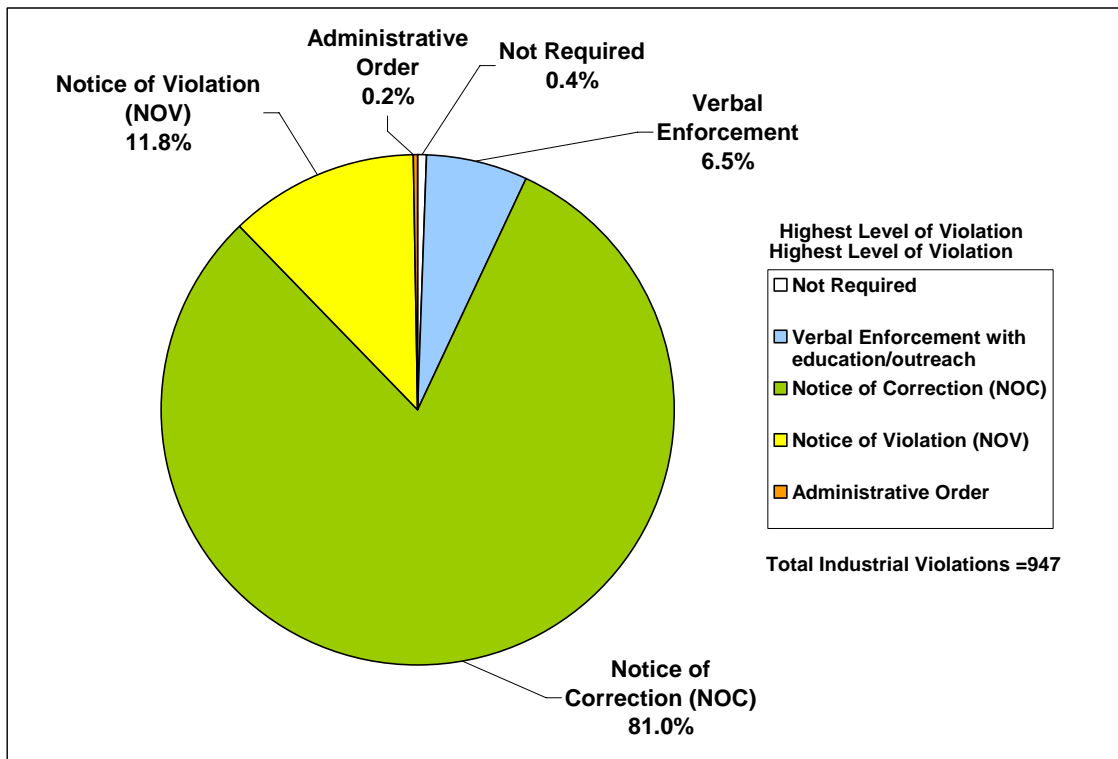
2.4.1 Industrial Facilities

Of the 1,561 total industrial facility inspections, violations were found during 933 (60%) inspections (Note that this is not equivalent to the number of facilities with violations—facilities may have had multiple inspections with or without violations). This is a significant increase over FY 2005-06, when violations were reported for 22% of total industrial inspections. **Figure 2.4.1** shows the breakdown of the severity of these violations. Approximately 81% of the violations required Notices of Correction and another 12% required Notices of Violation to help achieve compliance. Verbal enforcement was used in approximately 6.5% of these cases. The MS4 Database now serves as a comprehensive database for all Permittees. Several Permittees are still transitioning to the full use of the MS4 Database, and in the interim may document industrial facilities separately. Industrial facility databases from the MS4 Database, and any supplemental data submitted by the Permittees may be found in the attached CD-ROM.

Figure 2.4.2 shows the total number of industrial facilities by Permittee, and **Figure 2.4.3** shows the number of industrial facilities with a Statewide General Industrial Stormwater Permit (General Permitted Facilities) and those without (Non-General Permitted Facilities) by Permittee.

Figure 2.4.4 shows the number of General Permitted industrial facilities, by priority, for the individual Permittees. **Figure 2.4.5** shows the numbers of inspections and inspections with violations, by Permittee, for General Permitted industrial facilities. **Figure 2.4.6** shows the number of Non-General Permitted industrial facilities, by priority, for the individual Permittees. **Figure 2.4.7** shows the numbers of inspections and inspections with violations, by Permittee, for Non-General industrial facilities. Of 1,198 inspections at 1,147 (52%) Non-General Permitted sites, 714 (60%) inspections reported violations. Of 363 inspections at 318 (74%) General-Permitted sites, 219 (60%) reported violations. While there are differences in the ratio of violations to inspections among the Permittees, a considerable proportion of the facility inspections typically find non-compliance. This requires considerable followup effort by the Permittees to bring these facilities into compliance.

The Permittees are committed to outreach programs to inform and educate businesses (General permit sites and Non-General permit sites). At the same time, the Co-Permittees' inspection staff (e.g., Fire Department, Environmental Health & Safety personnel, etc.) are also being trained to include a stormwater inspection component as a part of the existing inspection programs.



*Figure 2.4.1
Area-Wide Makeup of General and Non-General Industrial Violations*

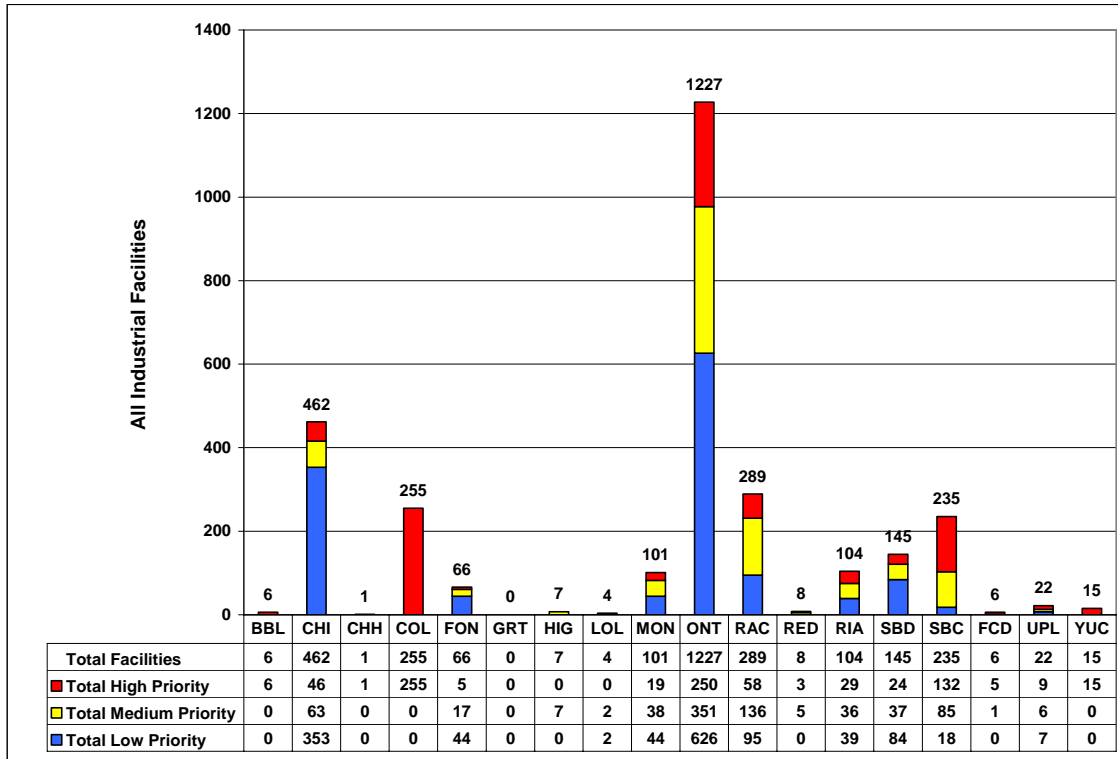


Figure 2.4.2
Total Industrial Facilities by Permittee

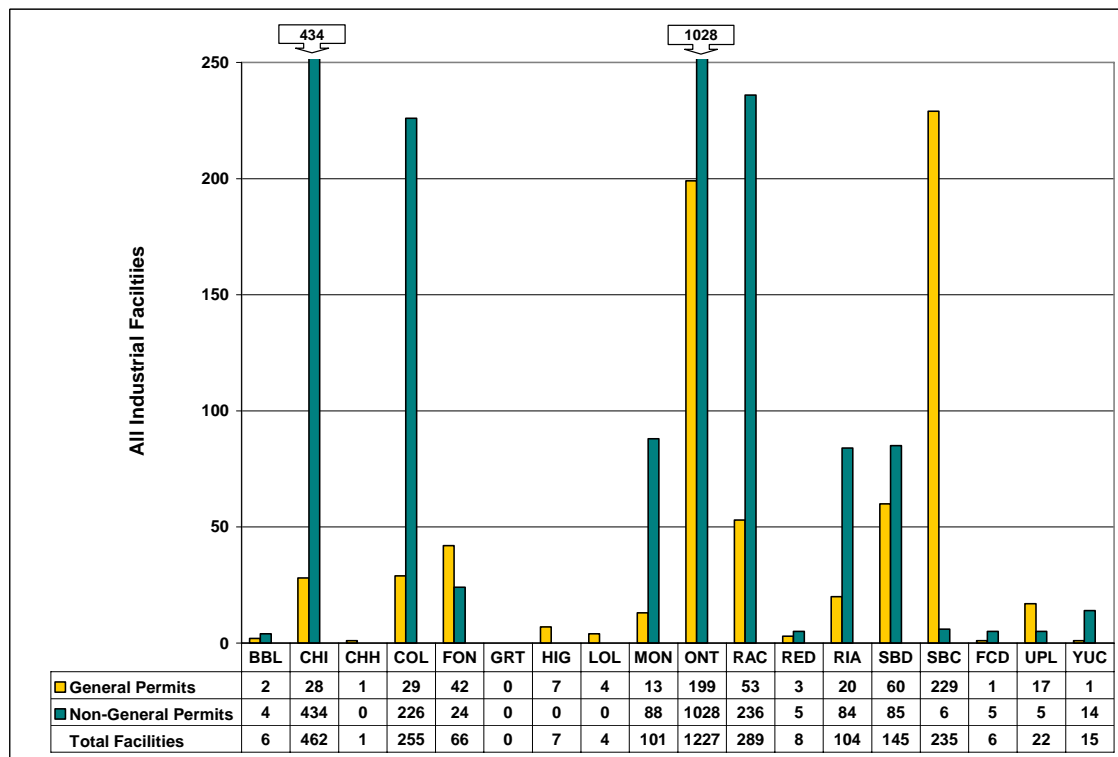


Figure 2.4.3
General Permitted and Non-General Permitted Industrial Facilities by Permittee

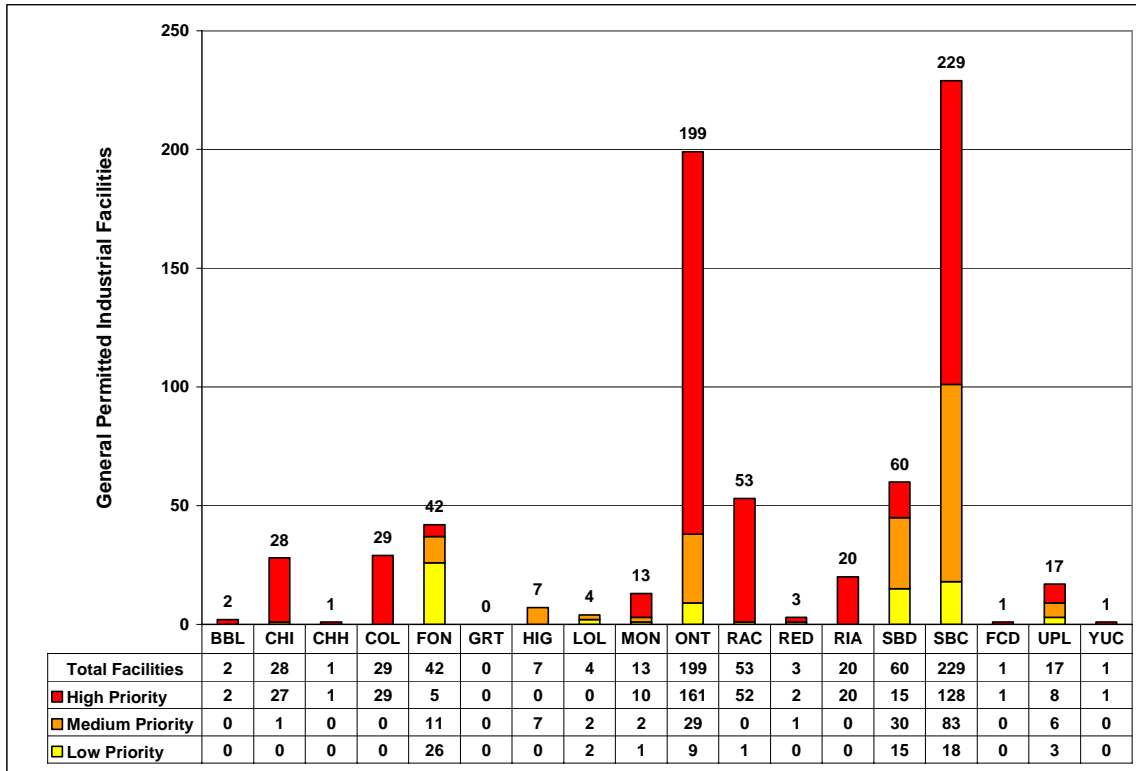


Figure 2.4.4
General Permitted Industrial Facilities and Priorities by Permittee

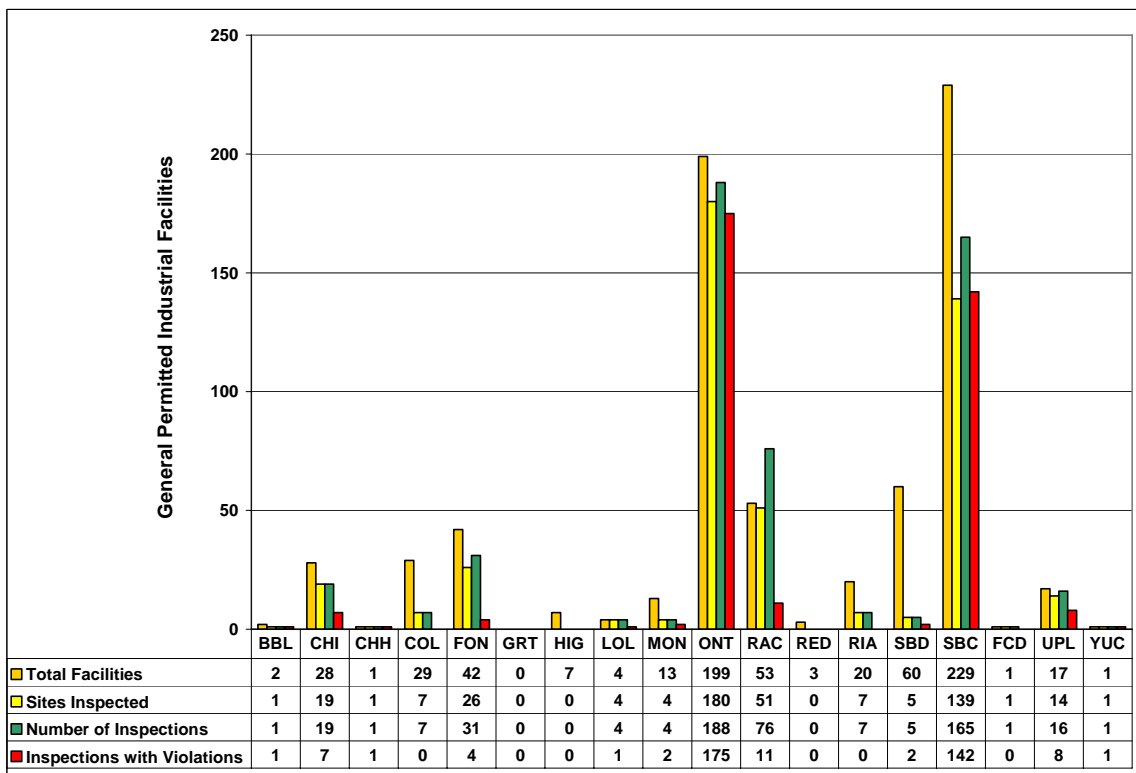


Figure 2.4.5
General Permitted Industrial Facility Inspections and Violations by Permittee

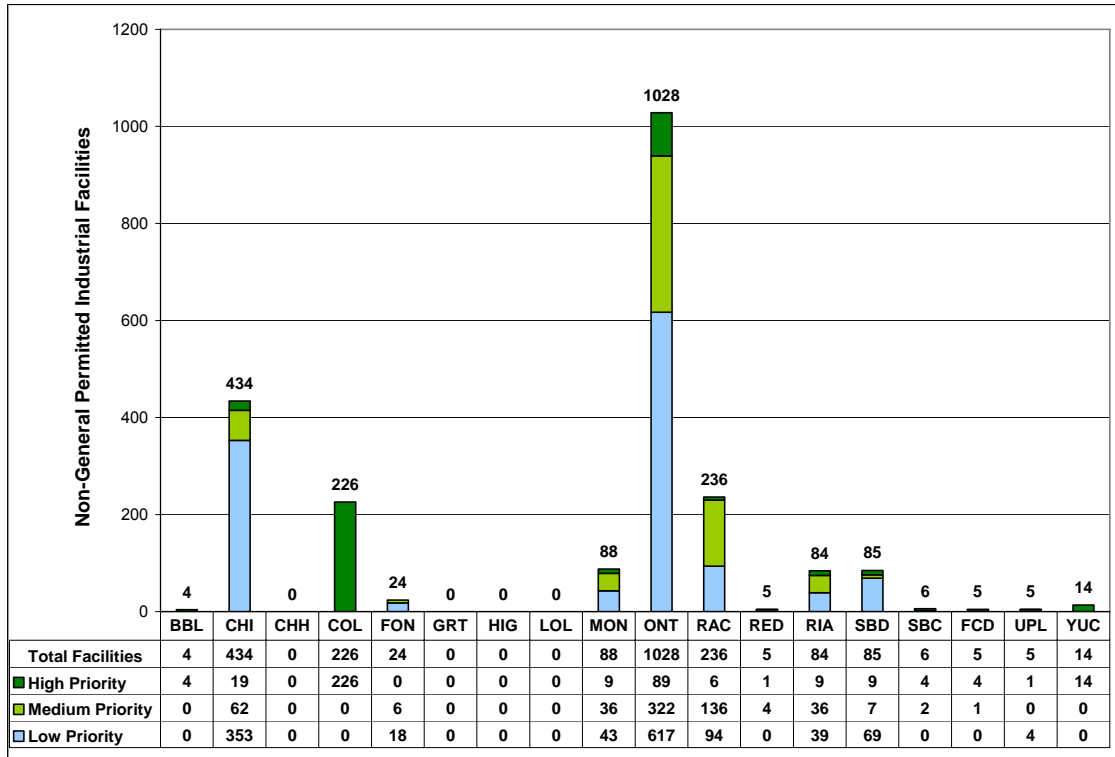


Figure 2.4.6
Non-General Permitted Industrial Facilities and Priorities by Permittee

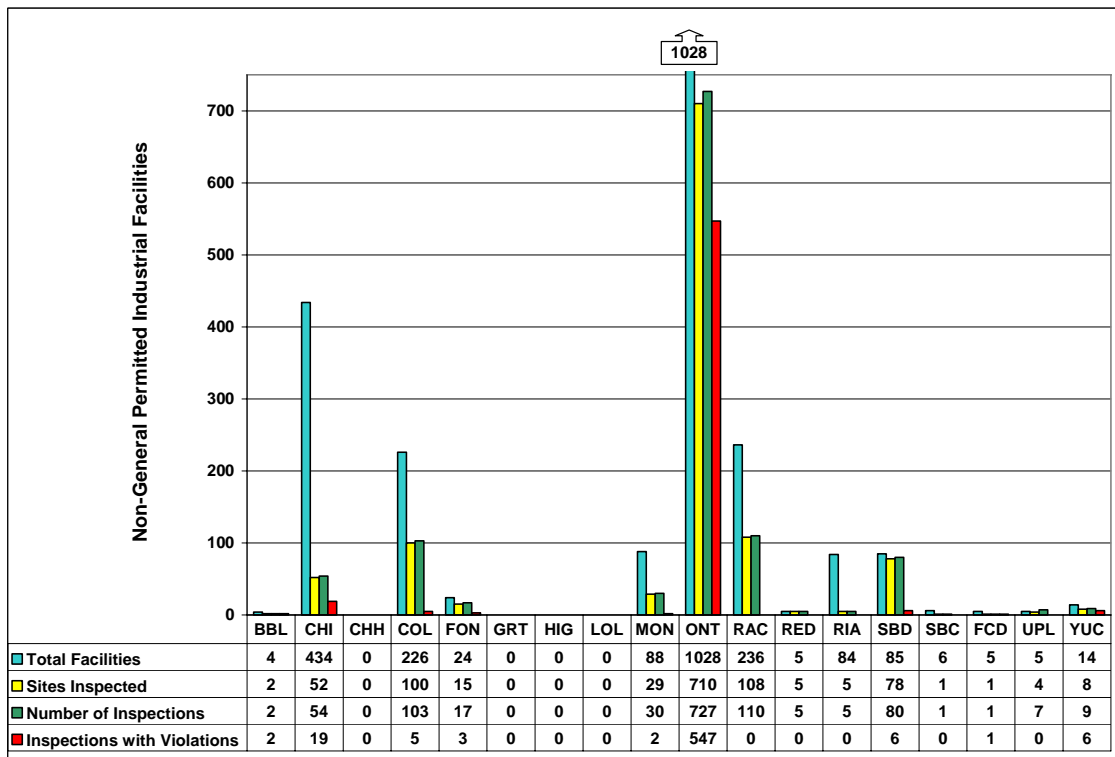


Figure 2.4.7
Non-General Permitted Industrial Facility Inspections and Violations by Permittee

2.4.2 Commercial Facilities

The Permittees conducted 2,292 inspections, with 704 (31%) inspections reporting violations cited; a total of 2,093 (20%) commercial businesses were inspected. Of the 2,991 commercial facility inspections conducted in FY2005/06, violations were found during 505 inspections (41%) (Note that this is not equivalent to the number of facilities with violations—some facilities may have had multiple inspections with violations). **Figure 2.4.8** shows the total number of commercial facilities by priority, by Permittee, and **Figure 2.4.9** shows the number of inspections and inspections with violations by Permittee. While there are differences in the ratio of violations to inspections among the Permittees, the implication is that large numbers of facility inspections find non-compliance. **Figure 2.4.10** shows the type and severity of the enforcement issued for commercial facility violations. Approximately 77% were moderate violations requiring Notices of Correction, 13.3% were minor violations resulting in verbal enforcement and education, 7.7% were more severe and warranted Notices of Violation. A few sites required administrative action or Stop Work Orders.

The MS4 Database serves as a comprehensive database for all Permittees. Several Permittees are still transitioning to the full use of the MS4 Database, and in the interim may document commercial facilities separately. Commercial facility databases from the MS4 Database, and any supplemental data submitted by the Permittees may be found in the attached CD-ROM.

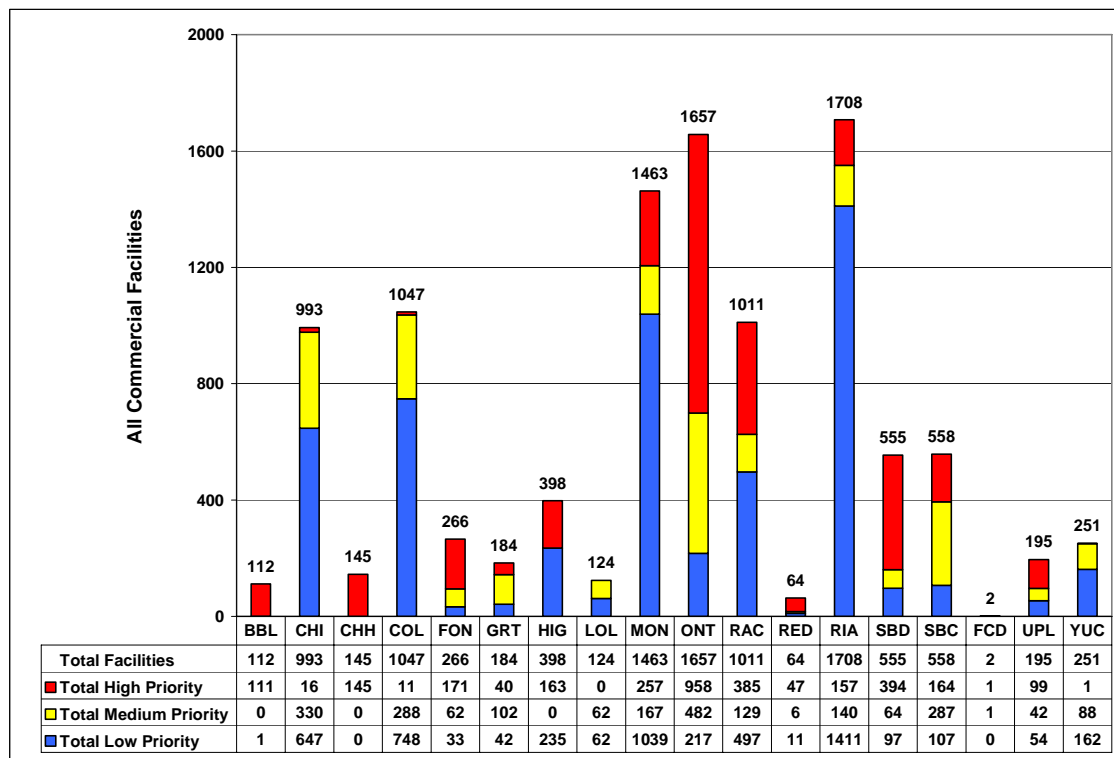


Figure 2.4.8
Total Commercial Facilities by Priority by Permittee

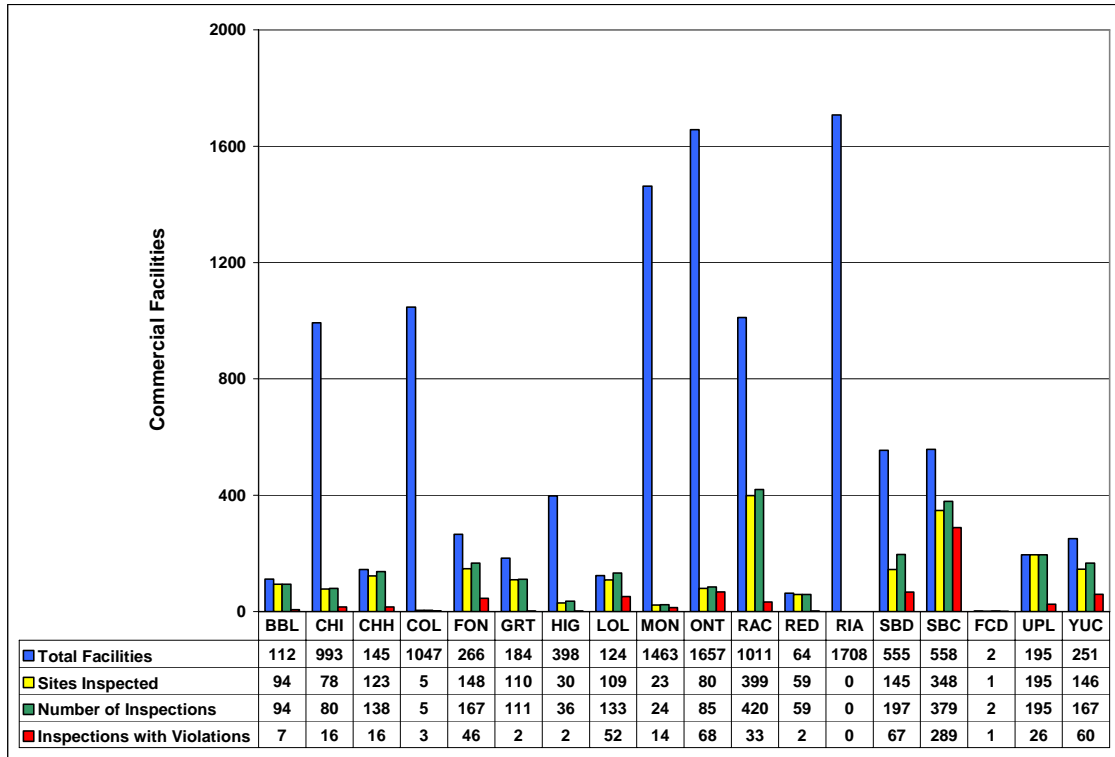


Figure 2.4.9
Commercial Facility Inspections and Violations by Permittee

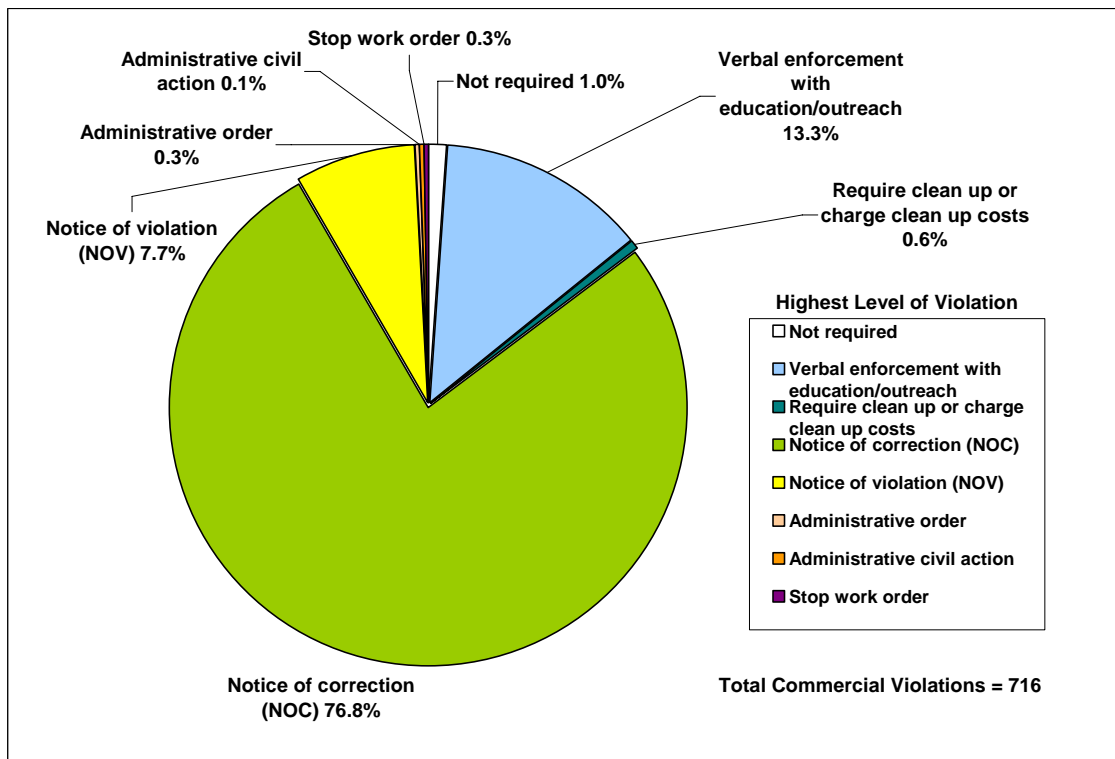


Figure 2.4.10
Area-Wide Makeup of Violations from Commercial Facility Inspections

2.5 New Development and Redevelopment Programs

The Co-Permittees have existing programs to address stormwater quality in conditions of approval for new development and redevelopment projects. The Principal Permittee does not have land-use authority, and therefore does not regulate new development and redevelopment. Stormwater issues are generally addressed via general plan and master plan/specific plan policies and California Environmental Quality Act (CEQA) review processes. Because there was no uniformity in the review process, model uniform guidelines were developed beginning in FY 1997-98, and were adopted in FY1999-00, and Co-Permittees began implementing the guidelines during FY 2000-01. These guidelines were revised in FY 2003-04 and are described in Section 2.5.2 below.

The Permit (Section XII.A.6) required the Co-Permittees to review their CEQA review processes by February 15, 2003, to ensure that stormwater issues were properly considered, and required all actions found necessary by the review to be completed by February 15, 2004. The Permit (Section XII.A.7) also requires the Co-Permittees to review their general plan and related documents to ensure that watershed protection principles and policies are properly considered and incorporated into these documents. Table 2-1 shows the various methods currently being used by the Permittees to address stormwater quality issues during project planning and design stages.

2.5.1 Erosion-Control BMP Effectiveness Study

The Permit (Section XII.A.11) required the Permittees to submit a proposal to evaluate the effectiveness of a group of selected erosion-control BMPs by November 15, 2003. This proposal was submitted, as required, in November 2003. However, as reported in the FY2005/06 Annual Report, the District has instead substituted for the erosion BMP study a project to map the channels and stream reaches in our area and identify any that may be subject to Hydrologic Conditions of Concern (HCOC). Project kickoff was in February 2006, and mapping of District Zones 1, 2, and 3 is under way. The entire District system in the Santa Ana Watershed area of San Bernardino County will be mapped and characterized from the HCOC perspective, to identify reaches that may require protection from runoff from development projects. We expect to receive funding from the Regional Board via Supplemental Environmental Projects to improve the map capabilities. The District also prepared a grant proposal under the State Water Board's Consolidated Grants Program, in an effort to obtain additional funding to enhance the map. Unfortunately the full proposal was not selected for funding. We expect the map to be completed in mid-2008 and it will be accessible via the World Wide Web.

Table 2-1: Methods Used to Address Stormwater Quality during Project Planning and Design Stage

Permittee	WDID Required Prior to Issuing Permits for Construction Sites and Industrial Facilities?	Are Stormwater Issues Addressed in General Plan and CEQA Process?	Are Stormwater Protection Principles and Policies Incorporated into General Plan?	Have Grading and Erosion Control Ordinances Been Reviewed and Revised if Necessary to Reduce Erosion?	Has a Local WQMP Been Developed?
Big Bear Lake	Yes	Yes	Yes	Yes	Yes
Chino	Yes	Yes	Yes	Yes	No
Chino Hills	Yes	Yes	Yes	Yes	Yes
Colton	Yes	Yes	Yes	Yes	Yes
Fontana	Yes	Yes	Yes	Yes	No
Grand Terrace	No	Yes	Yes	Yes	Yes
Highland	Yes	Yes	Yes	Yes	Yes
Loma Linda	Yes	Yes	Yes	Yes	Yes
Montclair	Yes	Yes	Yes	Yes	Yes
Ontario	Yes	Yes	Yes	No	Yes
Rancho Cucamonga	Yes	Yes	Yes	Yes	Yes
Redlands	Yes	Yes	Yes	Yes	Yes
Rialto	Yes	Yes	Yes	Yes	Yes
San Bernardino	No	Yes	Yes	Yes	No
San Bernardino County	Yes	Yes	Yes	Yes	Yes
SBC Flood Control District	Yes	N/A	Yes	Yes	N/A
Upland	Yes	Yes	Yes	Yes	Yes
Yucaipa	Yes	Yes	Yes	Yes	Yes
N/A=Not Applicable; N/R=Not Reported					

2.5.2 Water Quality Management Plan

The Permittees are implementing the WQMP as required, for development projects that meet the criteria. There have been numerous questions regarding pollutants of concern, HCOCs, and BMPs posed by developers and Permittee staff. To address these concerns, the Permittees are reviewing the WQMP Guidance and Template as part of the ROWD development and Permit renewal process. We anticipate making corrections and clarifications where appropriate.

2.5.3 Construction

The Co-Permittees were required to develop and maintain an inventory and database of construction sites in their jurisdictions, and to submit copies of these databases with each Annual Report. The MS4 Database serves as a comprehensive database for all Permittees. Several Permittees are still transitioning to the full use of the MS4 Database, and may document construction sites separately. Construction site databases from the MS4 Database, and any supplemental data submitted by the Permittees, may be found in the attached CD-ROM.

Permittees prioritize and inspect construction sites to determine compliance with their ordinances. During construction activities, Co-Permittees use their local grading ordinances as a mechanism to control activities of developers during grading operations to prevent sediment from entering storm drain systems. Issues related to prevention of potential pollutants from other activities associated with construction may also be addressed by general conditions or special provisions of contract documents.

The permit requires that during the wet season, all high priority sites must be inspected once a month, medium priority sites must be inspected twice per wet season, and low priority sites must be inspected at least once per wet season. The Permittees reported a total of 1,644 construction sites in FY 2006-07. **Figure 2.5.1** shows the total numbers of construction sites and priorities by Permittee. **Figures 2.5.2 through 2.5.6** show the number of General and Non-General permitted sites, and numbers of inspections and inspections with violations for General and non-General permitted construction sites by Permittee. There were 1,209 inspections at 325 General permitted construction sites that generated 203 violations (17%), and 2,577 inspections at 1,052 non-General permitted sites that generated 465 violations (18%).

Figure 2.5.7 shows the makeup of enforcement types used by the Permittees to address construction site violations for General and non-General permitted sites combined. Notices of Correction accounted for the majority 69% of enforcement actions for construction sites. Verbal enforcement, Notices of Violation, and stop-work orders accounted for approximately 31% of the actions. The number of inspections and ratio of violations to inspections varies by Permittee, in part due to differing definitions of inspections and violations. The Stormwater Program is working toward greater consistency in inspections, violations and reporting construction program results. As with the industrial and commercial inspections, significant follow-up effort is required to bring these facilities into compliance.

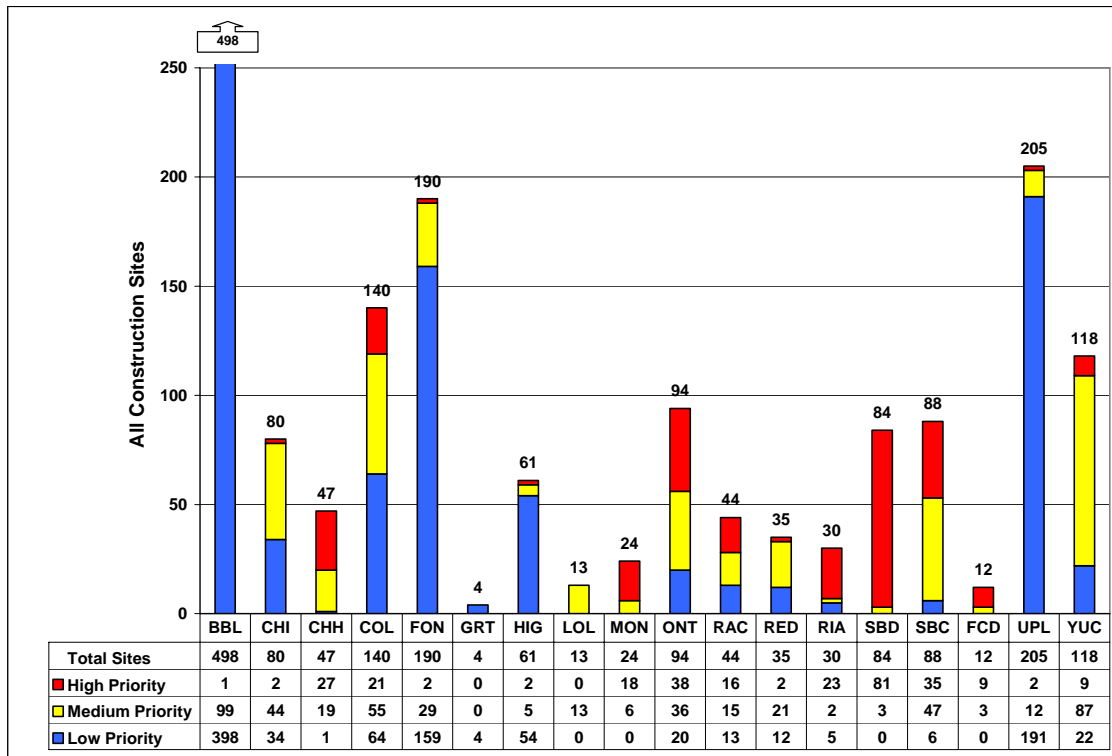


Figure 2.5.1
Total Construction Sites and Priorities by Permittee

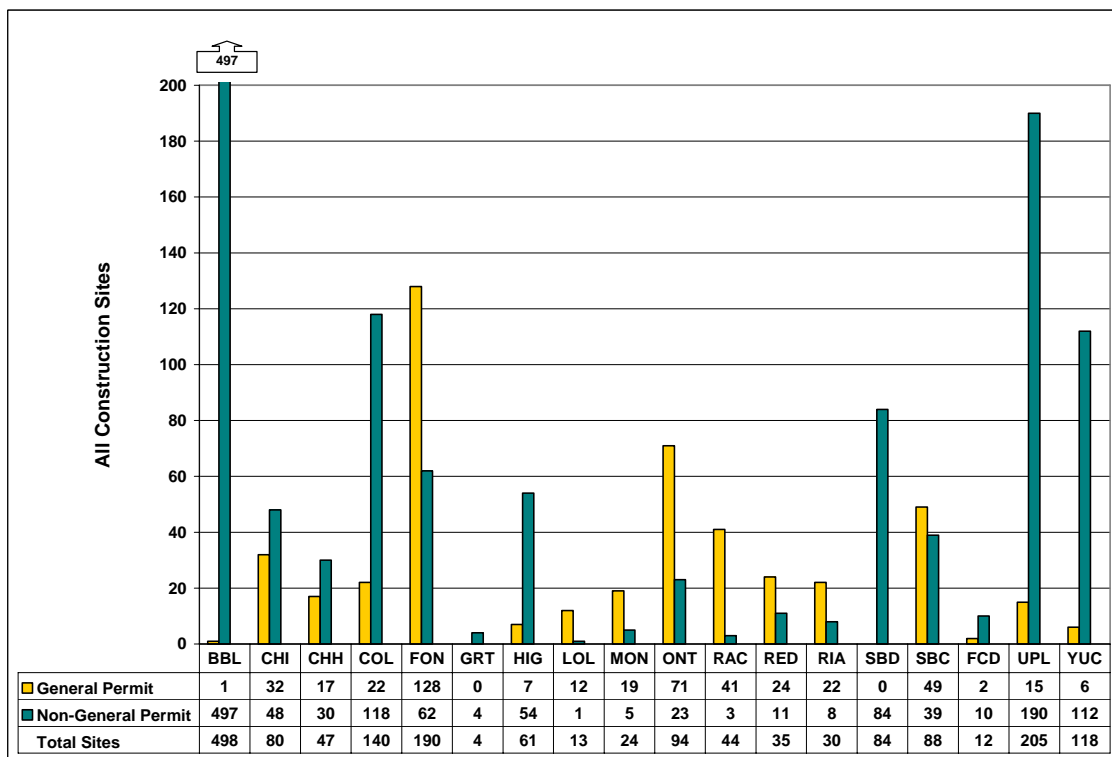


Figure 2.5.2
General and Non-General Permitted Construction Sites by Permittee

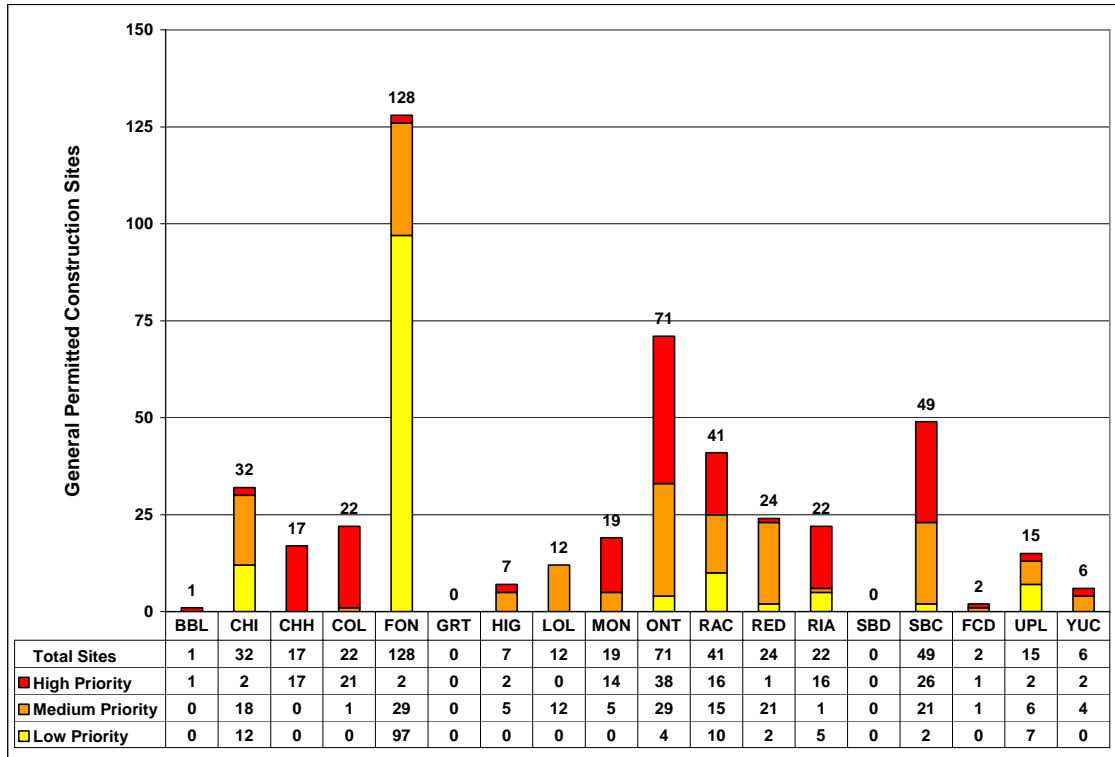


Figure 2.5.3
General Permitted Construction Sites and Priorities by Permittee

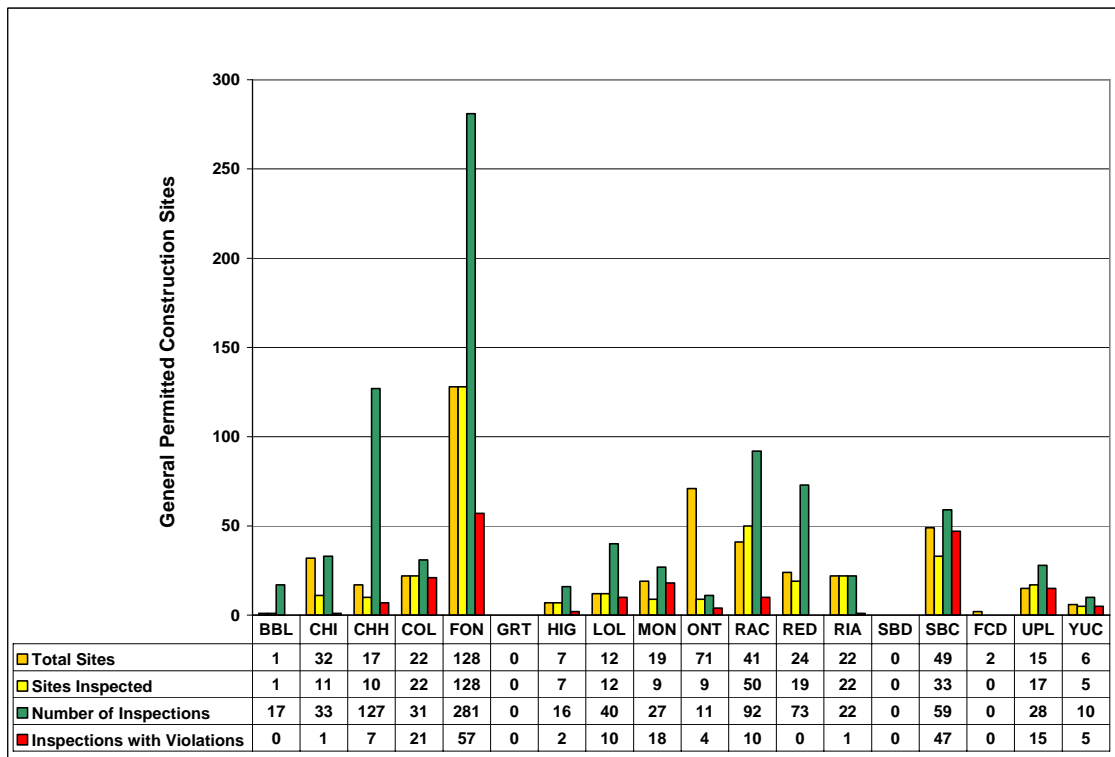


Figure 2.5.4
General Permitted Construction Site Inspections and Inspections with Violations

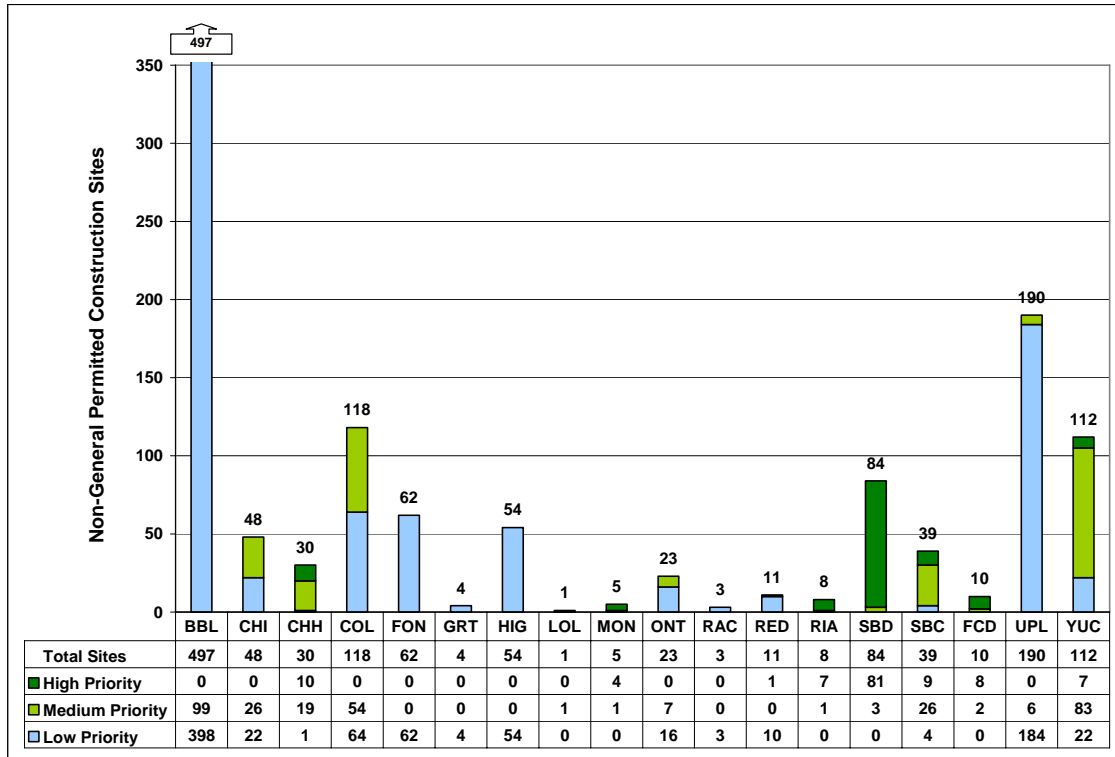


Figure 2.5.5
Non-General Permitted Construction Sites and Priorities by Permittee

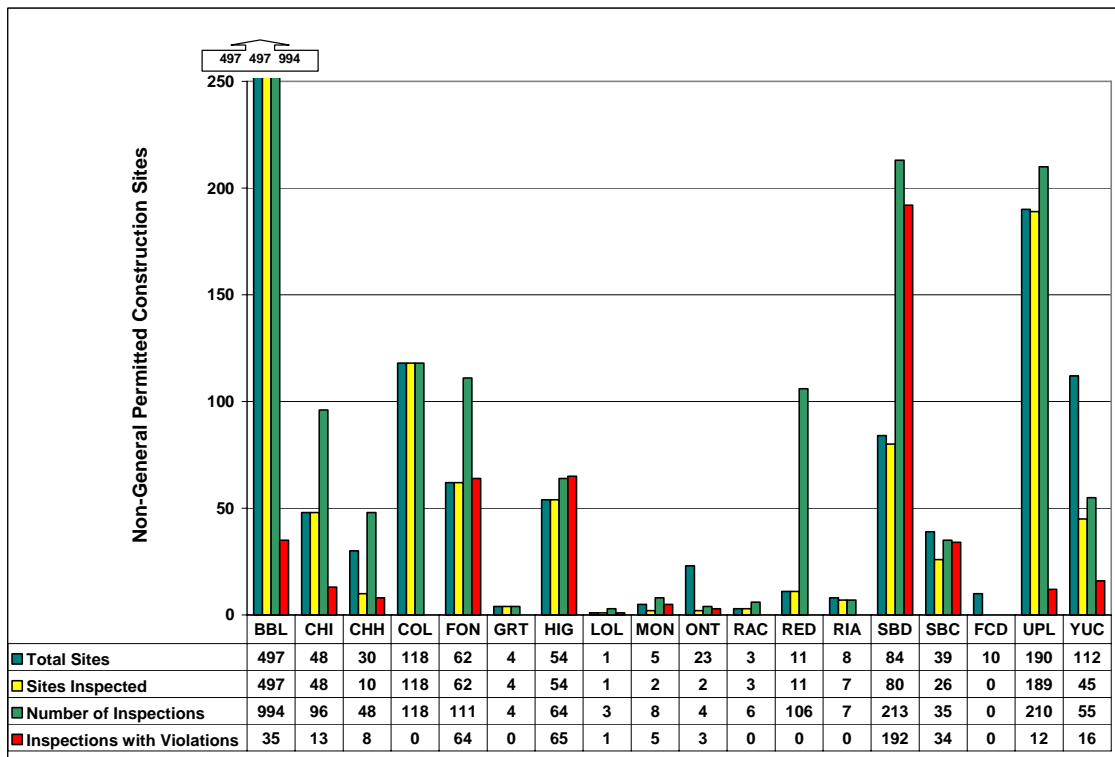


Figure 2.5.6
Non-General Permitted Construction Site Inspections and Inspections with Violations

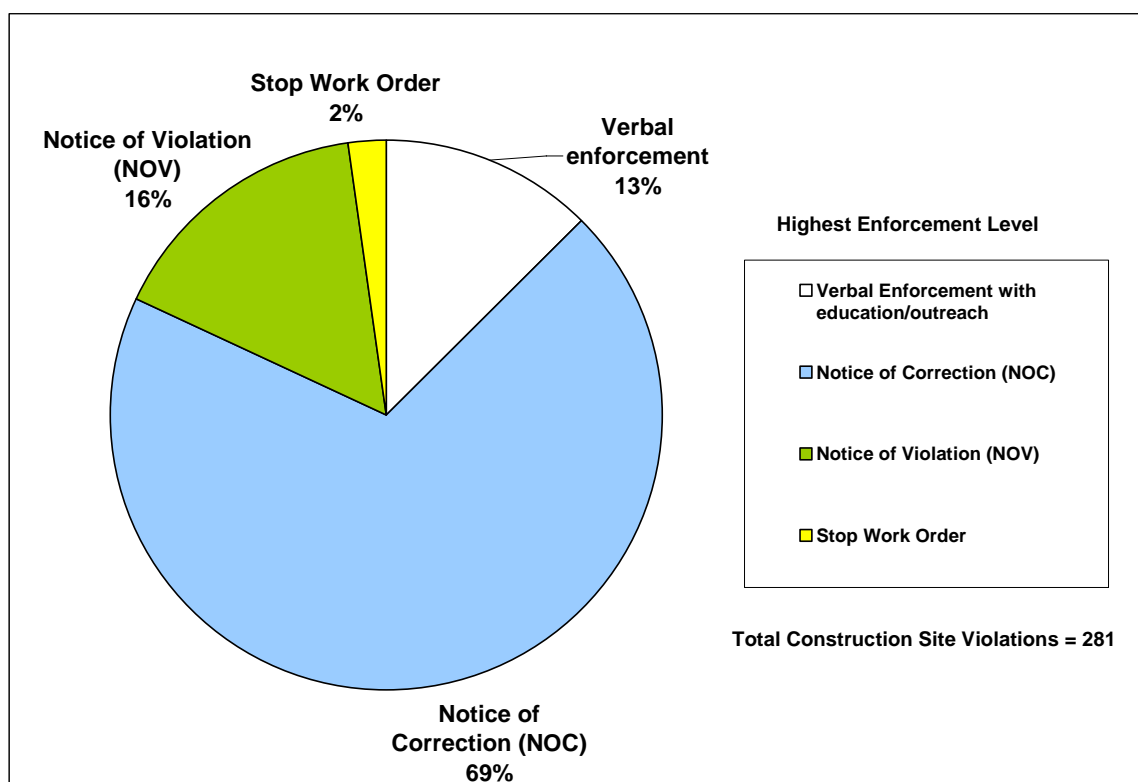


Figure 2.5.7

Area-Wide Makeup of General and Non-General Construction Site Enforcement Types

A construction video was developed for FY2001-02 as an educational tool for engineers, contractors, developers, and inspectors. This video shows various BMPs that should be implemented at construction sites to minimize the discharge of pollutants to the storm drain system. Copies of the video are made available to developers and contractors as an educational tool for their employees. The video has also been shown at various NPDES related workshops and seminars. Training for construction staff was also provided in the online training program (see Section 2.6.5), and the Permittees are kept informed of any construction-related training available in the area, such as training conducted by Regional Boards or neighboring stormwater programs.

Some construction projects require CEQA review processes, which must consider stormwater quality issues. Additionally, for projects that disturb at least one acre of land, a Notice of Intent (NOI) must be filed with the Regional Board to obtain coverage under the General Stormwater Permit for Construction Activities. All of the Co-Permittees require proof of submittal of an NOI prior to issuance of a grading or building permit for projects subject to the General Permit.

2.6 Public Agency Activities Programs

The Permittees perform activities that may have impacts on stormwater quality. These activities include, but are not limited to, the construction and maintenance of streets, the maintenance of public facilities, and the construction and maintenance of flood control facilities and corporation yards. The Permittees have identified major sources of possible pollutants associated with these activities and have developed BMPs to be implemented by each Permittee. Stormwater BMP Handbooks, prepared in conjunction with the California Stormwater Quality Association (CASQA), are used as guidance documents in training public employees and implementing site-specific BMPs. CASQA conducted a series of training sessions for their BMP handbooks, which were well-attended by Permittee staff in 2003. As of June 2004, 838 agency staff members, representing all the Permittees, had been trained on stormwater issues. Training for Permittee staff continued this reporting year through in-house training, videos, and various outside sources, and the newly-developed online training program (Section 2.6.5).

Previous Annual Reports reported the number of municipal construction projects that filed Notices of Construction, and other municipal facilities with General Industrial Permits (see **Figure 2.6.1** in the 2003-04 Annual Report). However, the MS4 Database tracks those projects in the same manner as all other construction sites, and this report includes them in the construction section. Municipal facilities and inspections are shown in **Figure 2.6.1**. During FY 2006-07, ten Permittees inspected all of their facilities at least once, one inspected 93% (RIA), one 83% (SBC), one 50% (FON), one 40% (YUC), one 28% (ONT), and four reported no inspections. Two inspected their facilities more than once each (CHH, LOL, and MON).

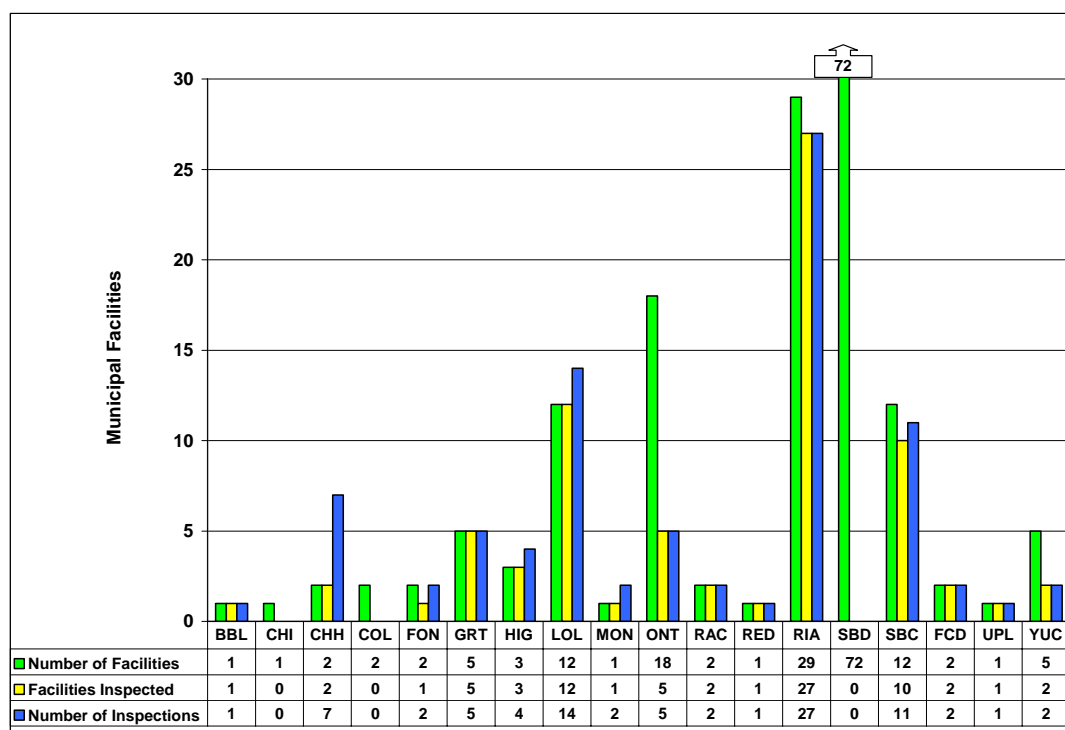


Figure 2.6.1
Municipal Facility Inventory and Inspection by Permittee for FY 2005-06

2.6.1 Storm Drain System

In addition to reducing all pollutants in stormwater, it is the policy of each Permittee to prevent sewage from entering the storm drain system. Spill response procedures have been developed for immediate response to notifications of sewage spills, proper disposal of the sewage, and documentation of each occurrence. Standard operating procedures and spill response plans have been evaluated and are considered adequate by a majority of the Permittees. The City of Rancho Cucamonga has the standard operating procedures for spill response on file from the Cucamonga County Water District, the entity owning the sewer system.

The Co-Permittees assisted the Inland Empire Utilities Agency to develop a unified response plan for sanitary sewer overflows during FY2002-03. The cooperative plan was submitted to the Regional Board. This plan is used as guidance, but has not been formally adopted or implemented, pending further comment or follow-up from the Regional Board.

2.6.2 Corporation Yards

Generally, corporation yards are used by the Permittees to service and maintain vehicles and equipment, and to provide storage for materials associated with municipal operations. Currently, the Permittees are implementing preventative measures such as “good housekeeping” practices, proper sheltering of stored materials, on-site retention of pollutant discharges, and personnel training. A complete list of BMPs associated with corporate yard activities is included in the CASQA Municipal BMP manual.

2.6.3 Street and Road Maintenance

Street sweeping is recognized as an effective practice for preventing pollutants swept or blown into the streets from entering the storm drain systems. Most Co-Permittees have street sweeping programs in place that service virtually every curb-mile of street each year. Co-Permittees believe that this effort is having a substantial impact on stormwater quality.

Figures 2.6.2 and 2.6.3 illustrate the extent and percentage of curb-miles swept every year, by residential, commercial, and industrial land uses. For some Permittees, the relative miles swept per land use are estimated because street sweeping is scheduled and tracked based on type of street or intensity of street use.

Co-Permittees reported an inventory of approximately 8,162 curb-miles of streets, with nearly 100% swept at least once this year. Several Permittees sweep streets as frequently as once per week in some areas. The County does not have a formal street sweeping program because most paved county roads are rural, without curb and gutter. Street sweeping in County areas may be conducted sporadically in response to reported problems. This year a total of over 2,200 tons of sediment and debris were removed by street sweeping, based on the test area results reported by nine Permittees. **Figure 2.6.4** provides an estimate of the tonnage of sediment and debris removed by street sweeping activities by land use.

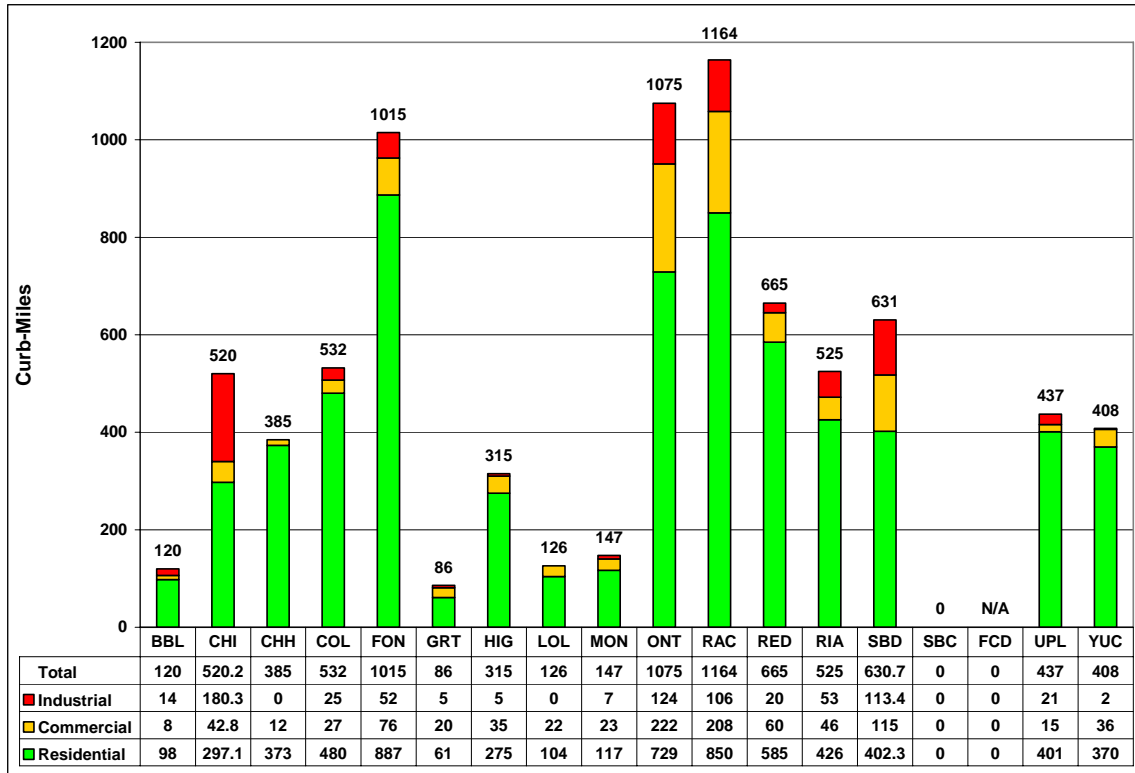


Figure 2.6.2
Street Sweeping: Inventory of Curb-Miles by Permittee

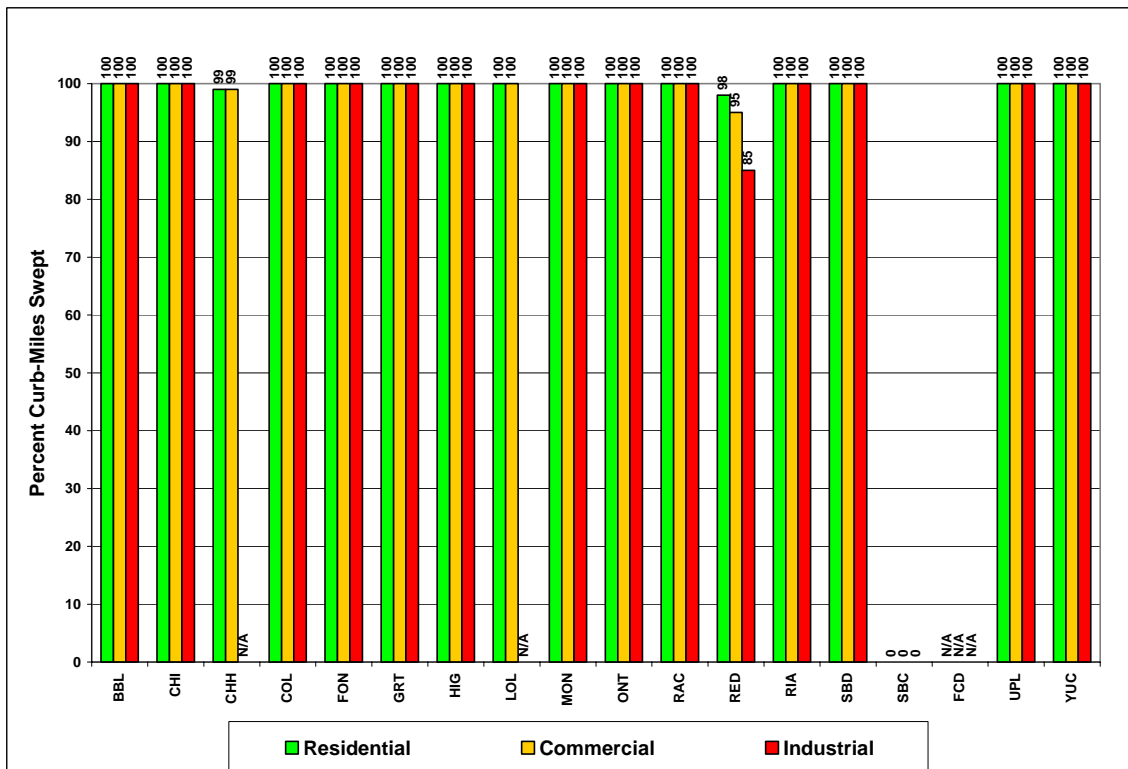
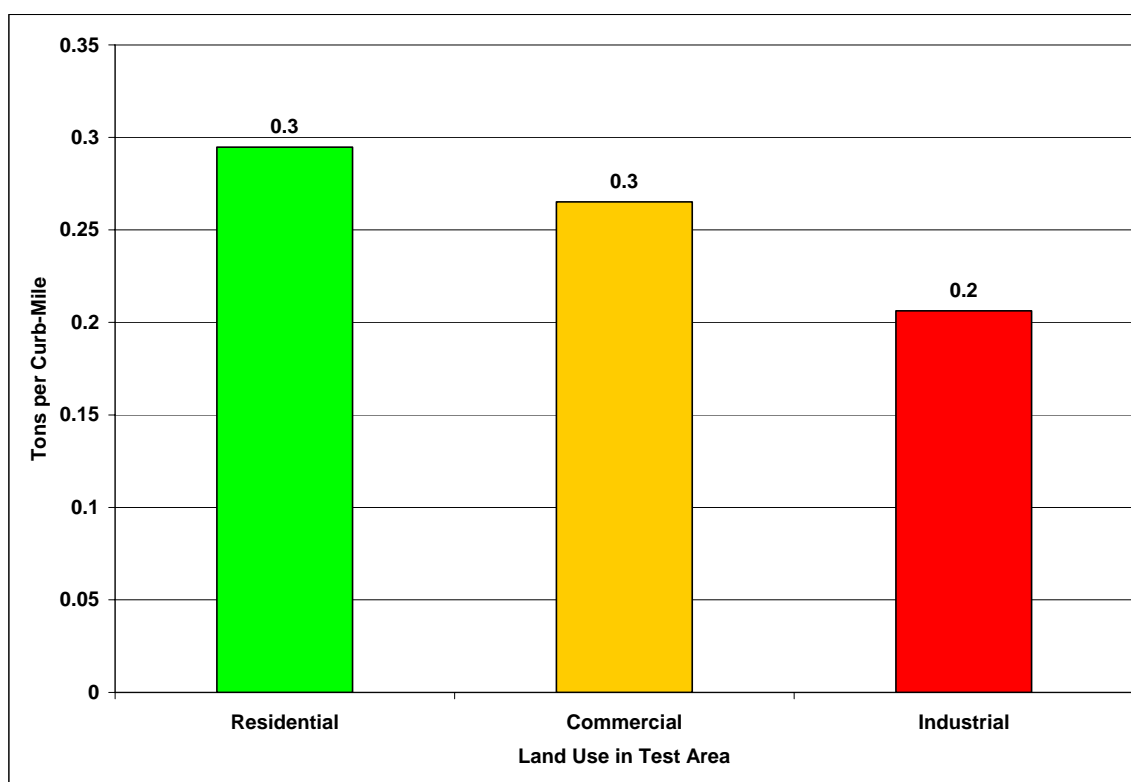


Figure 2.6.3
Street Sweeping: Percent Curb-Miles Swept by Permittee During FY 2006-07



*Figure 2.6.4
Street Sweeping: Tonnage of Sediment and Debris Removed per Curb-Mile*

2.6.4 Drainage Facilities

Proper operation and maintenance of flood control/drainage facilities can have a significant effect on stormwater quality. The Co-Permittees' municipal drainage facilities generally consist of detention and retention basins, small open channels and ditches, gutters and inlets, and underground facilities. These local facilities convey runoff into larger flood control facilities (e.g. channels, detention basins, debris basins, and underground facilities) that are typically operated and maintained by the District. Section XIV of the Permit requires the inspection of all inlets, open channels and basins once each reporting year and maintenance of at least 80% of drainage facilities on an annual basis, with 100% maintained in a two-year period. Maintenance of drainage facilities in the unincorporated County areas is performed by District staff as directed by the County. **Figure 2.6.5** shows the percentage of drainage facilities cleaned by Permittees, by type, for FY 2006-07.

This year, approximately 12,113 cubic yards of materials were removed from drainage facilities by the Permittees. Approximately 78% of inlets, 80% of open channels, 30% of underground drains, and 47.5% of detention basins have been cleaned by the Permittees.

The Permit (Section XIV.9) also requires the Permittees to annually evaluate the inspection and maintenance frequency for all or for portions of their drainage facilities. Most Permittees did not propose increased inspection or maintenance frequencies based on these evaluations. Results of individual Permittee evaluations are shown in **Table 2-2**.

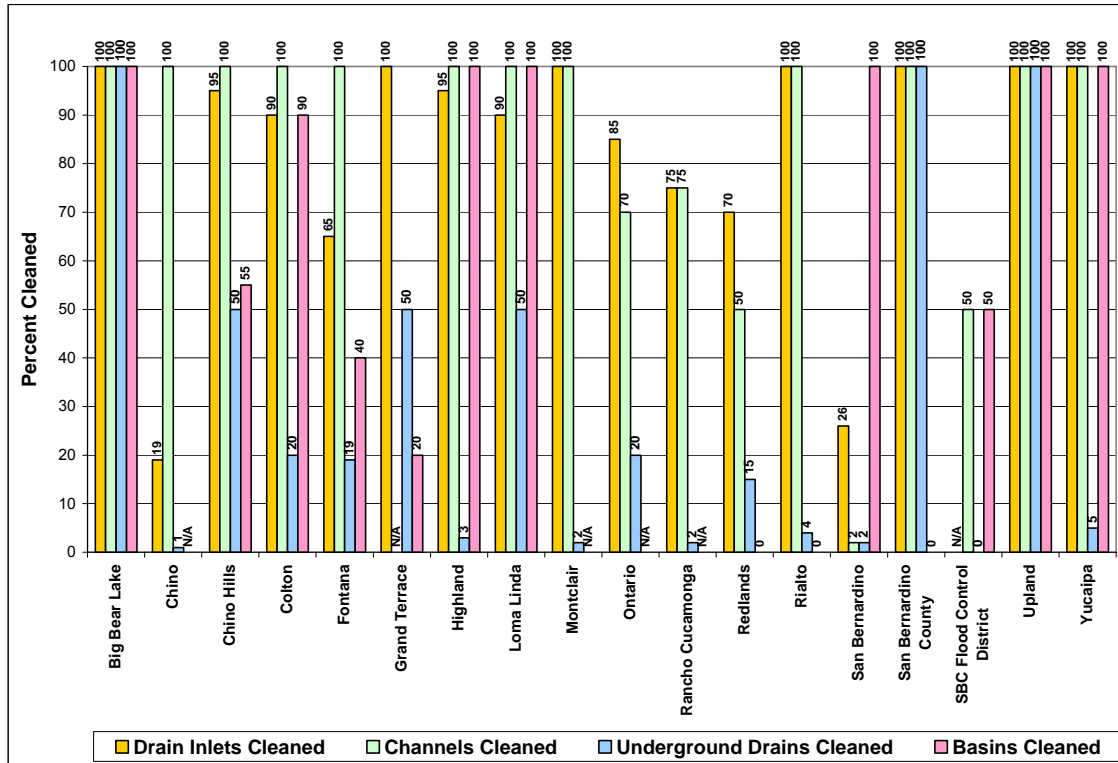


Figure 2.6.5
Percentage of Drainage Facilities Cleaned by Permittee for FY 2006-07

Table 2-2: Permittee Inspection and Maintenance Procedure Review

Permittee	Parks & Rec. Maint.Practices Reviewed?	Parks & Rec. Maint.Practices Modified?	Control/Drainage Maint.Practices Reviewed?	Control/Drainage Maint.Practices Modified?	Other Public Fac. Maint.Practices Reviewed?	Other Public Fac. Maint.Practices Modified?	Sewage Spill SOPs Reviewed?
Big Bear Lake	Yes	No	Yes	No	Yes	No	Yes
Chino	Yes	No	Yes	No	Yes	No	No
Chino Hills	No	N/R	Yes	Yes	Yes	Yes	Yes
Colton	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fontana	Yes	No	Yes	No	Yes	No	Yes
Grand Terrace	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Highland	Yes	Yes	Yes	No	Yes	No	Yes
Loma Linda	Yes	No	Yes	No	Yes	No	Yes
Montclair	Yes	No	Yes	No	Yes	No	No
Ontario	Yes	Yes	No	No	Yes	No	No
Rancho Cucamonga	Yes	No	Yes	No	Yes	No	Yes
Redlands	Yes	N/R	Yes	N/R	Yes	N/R	Yes
Rialto	Yes	No	Yes	Yes	Yes	No	Yes
San Bernardino	Yes	Yes	No	No	Yes	Yes	Yes
San Bernardino County	Yes	No	Yes	No	Yes	No	Yes
SBC Flood Control District	N/A	N/A	Yes	No	N/A	N/A	Yes
Upland	Yes	No	Yes	No	Yes	No	Yes
Yucaipa	Yes	No	Yes	No	Yes	No	Yes

As shown on **Figure 2.6.6**, an effort was made to characterize material cleaned from storm drain facilities. Nearly 100% of material was characterized by visual observations. Generally, the composition of material cleaned by Permittees was approximately 47% organic matter, 26% sediment, and 20% litter/trash, with approximately 7% non-characterized “other” material. There was significantly less rainfall during FY 2006/07 and therefore a much smaller proportion of sediment was deposited and required removal.

The data presented in the **Figure 2.6.6** is approximate. Most of the Permittees have not had a mechanism in place to more accurately record the quantity and composition of material cleaned from drainage facilities. The Permittees are continuing to formulate a way to schedule, manage, and track municipal storm sewer system (MS4) maintenance. The proposed manner of accomplishing this goal is through the implementation of the MS4 Database and the Cityworks® program (described in Section 2.1).

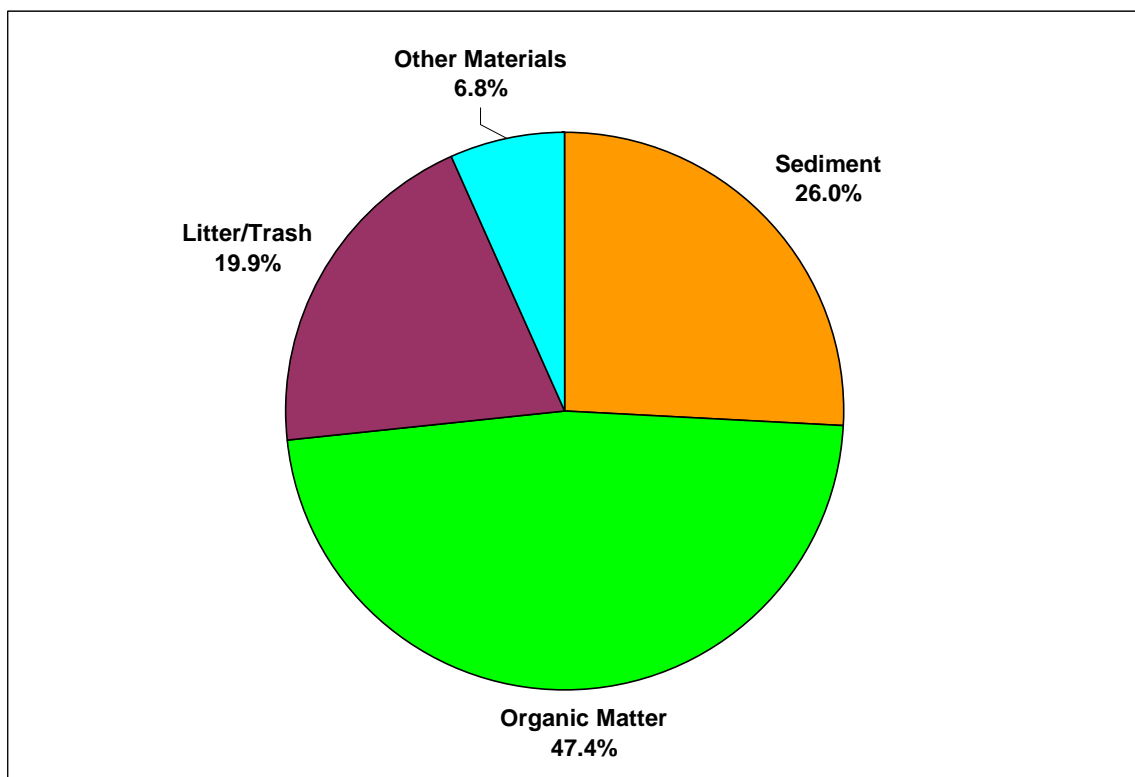


Figure 2.6.6
Approximate Composition of Material Removed from Drainage Facilities Area-Wide

2.6.5 Training Programs

Training of public agency personnel regarding public agency activities is an important element in the Stormwater Program. Stormwater pollution prevention training includes the following activities: storm drain facility operation and maintenance; maintenance of corporation yards; maintenance of parks and recreation facilities; inspection of construction and industrial activities; waste management practices; maintenance of public roads; use of pesticides and herbicides, and operation and maintenance of other public facilities. BMPs for

most of these activities are included in the CASQA Municipal BMP Manual. Employees are made aware of the need for cooperation and coordination of various department activities to protect stormwater quality.

Two separate 4-hour training programs were developed during FY 1999-00 (referred to as MAPPS (Municipal Activities Pollution Prevention Strategy) training). These programs focused on construction and maintenance activities and were developed for supervisory level personnel. Training classes were videotaped with the intent to provide the tapes to the Permittees so that training could be provided to appropriate staff members. The MAPPS videos are still in use, but the Training Subcommittee continues to develop new and improved training materials, to conduct training seminars, and to inform the Permittees of local and regional training opportunities outside the Stormwater Program. The Permit requires that training shall be provided to municipal staff annually, and that key staff shall attend at least three training sessions during the five-year Permit term. **Figure 2.6.7** summarizes the number of key staff trained during the last two years, by Permittee. The Permit does not specify training for non-key staff, but the Permittees believe it is useful to educate other staff that may encounter stormwater issues. **Figure 2.6.8** summarizes the number of non-key staff educated in general stormwater principles during the reporting year.

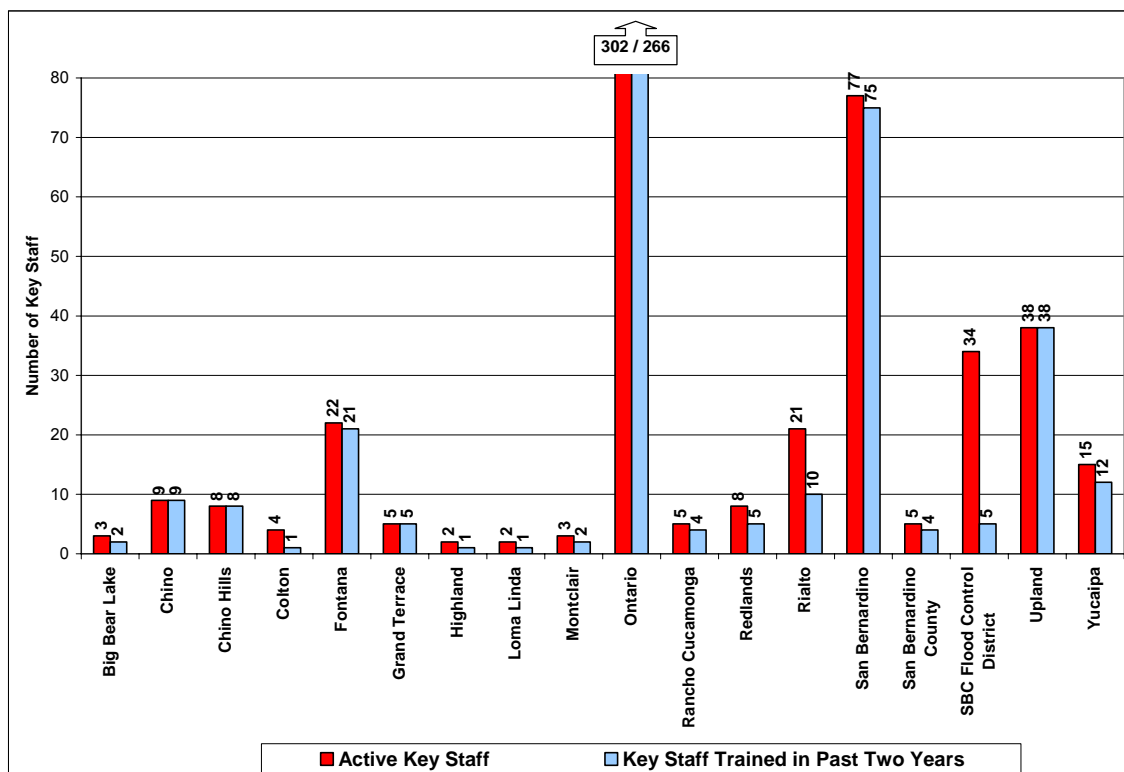


Figure 2.6.7
Summary of Key Staff Trained

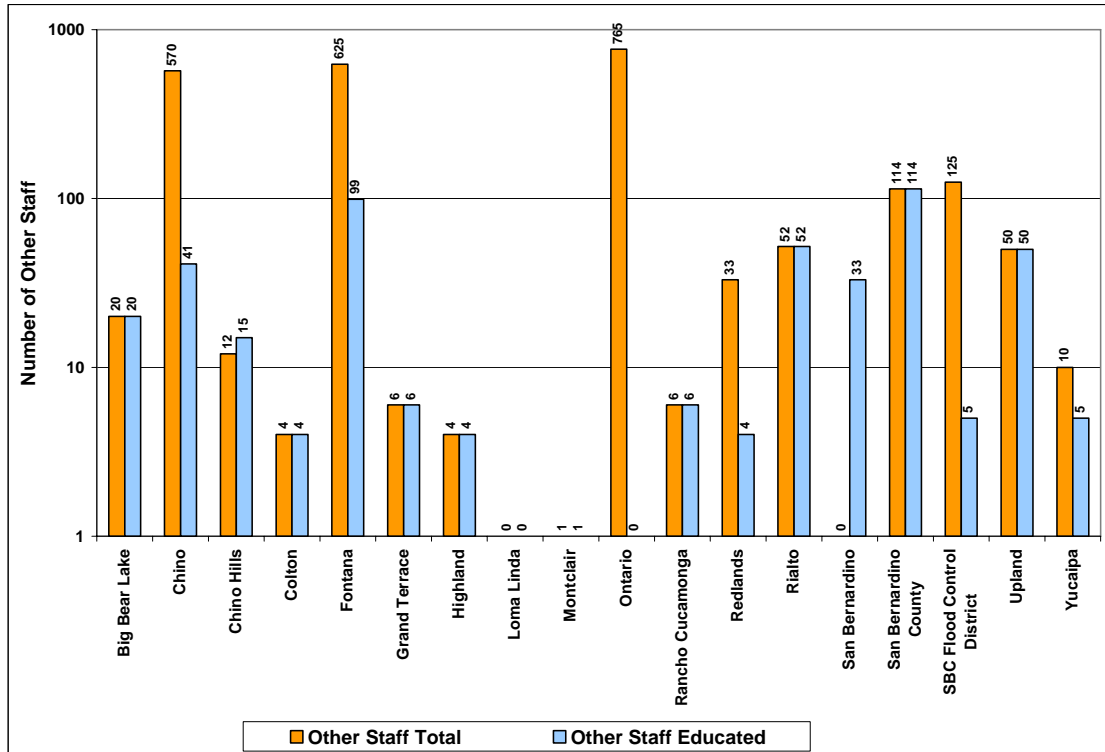


Figure 2.6.8
Summary of Non-Key Staff Educated in Stormwater

Figure 2.6.9 shows Permittee training events and staff trained in addition to area-wide training events. Some of these were conducted by the Permittees and others were outside events.

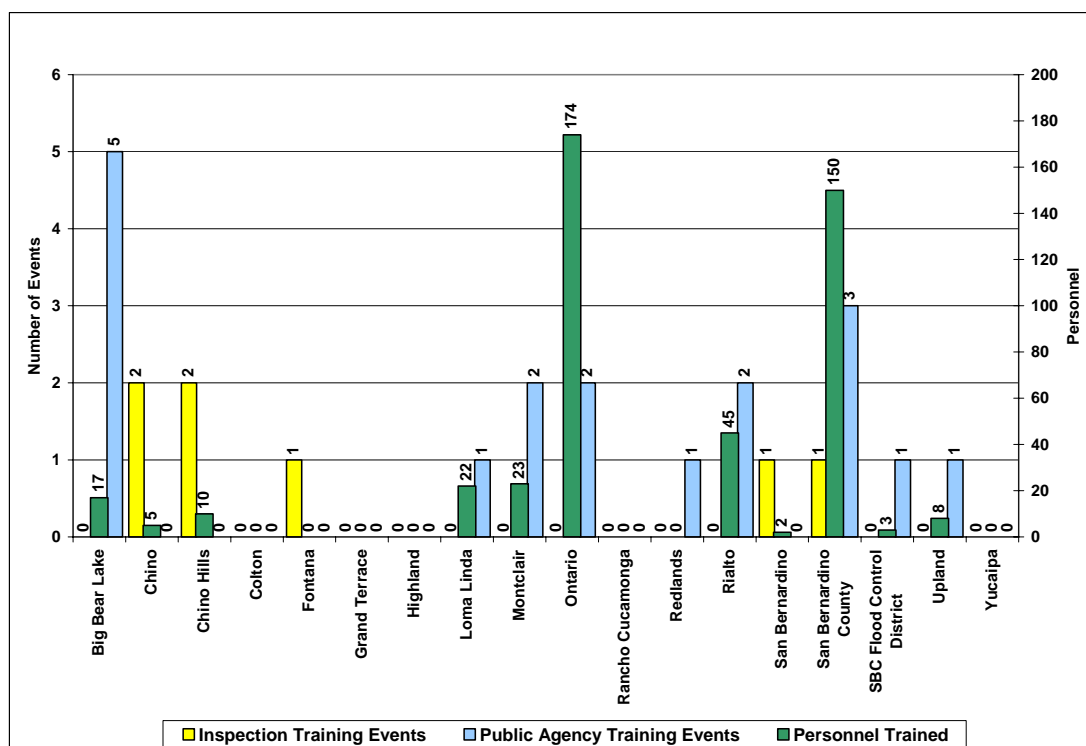


Figure 2.6.9
Additional Training Events and Staff Trained by Individual Permittees

The Training Subcommittee continued updating permit-mandated training for Co-Permittee staff during FY 2006-07. In order to improve access to stormwater training, the Training Subcommittee has developed an online stormwater training program that became active in July 2004. The online training program comprises separate modules for: general stormwater; commercial/industrial inspections; construction inspections; public agency maintenance activities; and WQMP review processes. The online training has been supplemented by various other training efforts, including live presentations, on the job site visits and tailgate meetings by the Permittees.

The Training Subcommittee continued to operate a training library, which lends training packets to member agencies. Each training packet includes a training DVD, handouts, quizzes, certificates and sources for additional information. The topical areas covered by the training packets include: municipal field maintenance staff, construction BMP implementation and industrial/commercial BMP implementation.

The area-wide program continued to host the training of the online training program throughout this reporting year. The online training program covered the following modules:

general stormwater, commercial/industrial inspections, construction inspections, public agency maintenance activities, and WQMP review processes.

The Training Subcommittee in coordination with the area-wide program hosted a number of events to assist member agency meet the training requirements contained in the permit. The following training events took place within the reporting period:

September 14, 2006 – Inspector training for conducting stormwater inspections at construction sites

- February 1, 2007 - Inspector training for conducting stormwater inspections at industrial/commercial facilities

The online training, training library and program training events were supplemented by various other out-of-program training. A partial summary of additional training opportunities used by member agency staff include:

- CASQA Annual Conference, October 23-26, 006
- SWRCB Low Impact Development Training, June 28, 2007
- CAL EPA Inspector Academy online training, various dates
- EPA Webinars, various dates

The area-wide program continued to host the online training program comprised of the following modules: general stormwater; commercial/industrial inspections; construction inspection; public agency maintenance activities; and WQMP review processes. The online training has been supplemented by various other training efforts, including CASQA workshops, Cal EPA/SWRCB workshops, tailgate meetings, and other stormwater seminars/workshops. Live training sessions for the 2006-07 reporting year are summarized below in **Table 2-3**.

Table 2-3: Live Training Seminars Conducted by the Area-wide Program in FY 2006-07

Course Title	Course Description	Target Audience	Course Length (hrs)	Total Staff Trained ***
Construction Inspection Training*	Half-day classroom and field-based training on erosion and sediment control BMPs at construction sites. Class was conducted in the field in the morning, followed by classroom instruction in the afternoon.	Field inspectors	6	55
Industrial Inspector Training**	Half-day classroom and field training with an inspection observation critique session.	Field Inspectors	6	45

*Class conducted in partnership with Centex Homes.

**Class conducted with assistance from Regional Boards.

***Attendance estimated.

2.7 Residential Programs

Stormwater pollution can be reduced by controlling discharge of potential pollutants at their source. Source activities in residential areas include vehicle washing, gardening, home maintenance, illegal dumping, pet ownership, and swimming pool/spa maintenance.

The Stormwater Program has developed fact sheets, brochures, and flyers, informing residents about the program. It coordinates with the Household Hazardous Waste (HHW) Collection Program to develop informational material for participation in the Program. The number of participants depositing materials at the HHW collection sites is approximately 37,878, over 10,000 more than last year. The 3.2 million pounds of HHW collected in FY 2006-07 was almost 50% greater than the amount collected in FY 2005-06. The Stormwater Program, the HHW Collection Program, and the Recycling Program are reaching out to the public to reuse, recycle, and buy only what is needed. Hopefully, the increase in the HHW amount collected reflects the positive impact of the program. **Figure 2.7.1** shows the quantities of various HHW products collected. The HHW Collection Program has a 24-hour hotline for reporting illegal dumping. This toll-free number is printed on all literature developed for the Stormwater Program. Citizens with questions about the Stormwater Program or desiring information related to a violation of the Program can call this number.

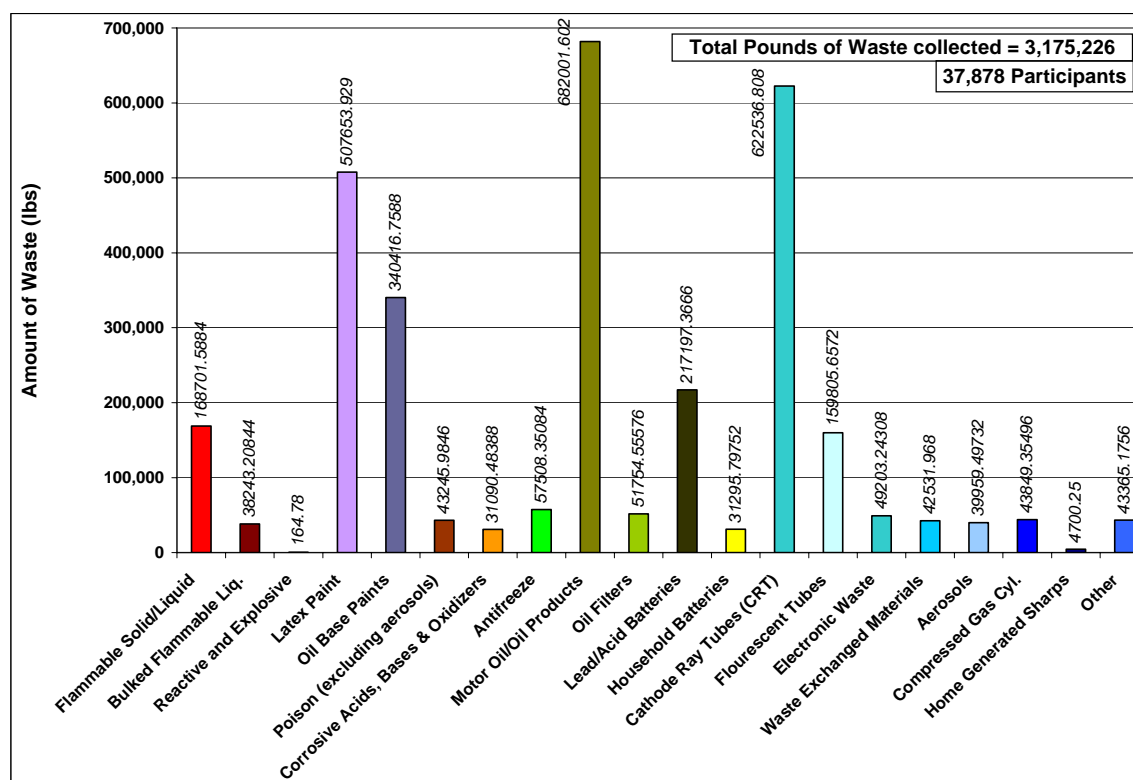


Figure 2.7.1
Area-Wide Total of Household Hazardous Waste Collected by Waste Type

2.8 Public Information and Participation

2.8.1 Purpose

According to the Environmental Protection Agency, stormwater pollution is cited as the leading cause of water contamination across the nation. The San Bernardino County Stormwater Program seeks to reduce the amount of pollution discharged into the stormdrain system. The objective of the program is to implement a public education program that encourages residents and businesses to adopt pollution prevention practices.

2.8.2 Program Goals

The program has three primary goals:

- Continue to increase awareness of stormwater pollution and its impact on our environment;
- Continue to educate residents and businesses on how to change their behavior to minimize pollution; and
- Maintain compliance with the NPDES Municipal Stormwater Permit.

2.8.3 Strategy

The strategy of the program is focused on directing the available resources in order to yield the highest potential of pollution reduction discharged into the storm drain system by San Bernardino County residents. The strategy is three fold:

- Conduct Pollutant-Specific Outreach—the campaign’s educational materials each identified a pollutant and the simple pollution prevention behavior(s) associated with it. Whenever possible, messages were delivered in settings tied to these pollutants, such as pet stores, paint stores and major home improvement stores.
- Mass Media Advertising Campaign—the campaign included paid media and pro-bono advertising featuring radio, newspaper and outdoor.
- Leverage Funds—to stretch existing program funds, the campaign developed partnerships with existing city and county programs and corporate enterprises to distribute educational messages to the target audiences.

2.8.4 Non-Media Outreach

In order to yield the highest potential of pollution reduction, the program executed a comprehensive set of outreach activities. This included forming partnerships with home improvement stores, hardware stores, paint stores, garden centers/nurseries and pet facilities in order to place outreach materials and train store managers and employees.

Outreach materials included tip cards, shelftalkers, tearsheets, fact sheets and posters. Tip cards provided easy-to-follow pollution prevention tips. Shelftalkers, with tearsheets

attached, provided the same information and were placed in the appropriate sections. Tearsheets listed locations of household hazardous waste centers, as well as hours of operation, and were placed on counters in paint sections and other check out counters. This allowed customers to tear off individual sheets and take the information with them. Tip cards, shelftalkers, tearsheets, and the posters promoted the (800) OILY-CAT hotline and the www.cleanup.org website, as a source for more information for residents. Additionally, the program utilized two types of posters, one poster encouraging the proper disposal of household hazardous waste and another poster used in pet facilities to encourage pet owners to pick up after their pets in order to prevent pollution.

2.8.5 Partnership with Home Improvement, Garden Centers, Nurseries, Paint, and Hardware Stores

Goals

- Continue to develop and maintain corporate and private party partnerships with home improvement stores, garden centers, nurseries, paint stores and hardware stores throughout the County.
- Continue to place public educational materials in appropriate locations (paint tip cards in paint section, etc.) in stores throughout the area.
- Promote the (800) OILY-CAT hotline and the www.cleanup.org website. Encourage employees and residents to refer to these resources for questions.
- Expand the target area of non-media outreach to improve awareness and increase the reach of the message to residents throughout the San Bernardino County permit area.
- Develop and maintain partnerships with home improvement stores in order to have presentations educating their employees, as well as tablings in front of the stores to provide outreach to residents in their community with the stormwater pollution prevention message.

Results

- Maintained partnerships with 114 home improvement stores, garden centers, nurseries, paint stores and hardware stores. (See Appendix A: p.12-29)
- Worked with retail stores to train 343 employees on Best Management Practices (BMP) and the proper disposal of paint, pesticides and fertilizers, furthering their ability to pass on these pollution prevention messages to their customers. (See Appendix A: p.12-29)
- Distributed approximately 41,072 public education materials at retail stores throughout the County; including, tip cards, shelftalkers, tearsheets, posters and fact sheets. (See Appendix A: p.12-29)
- Conducted six (6) presentations at home improvement stores, educating 88 store staff employees. (See Appendix A: p.52-53)

- Developed partnerships with major home improvement stores and held nine (9) tablings at Home Depot and/or Lowe's. Set up a table with the program information near the front of the store. Distributed public education materials and spoke one-on-one to residents regarding stormwater pollution prevention, educating 1,025 residents. (See Appendix A: p.51-52)

Listed below is a summary of the materials placed at home improvement stores, garden centers, nurseries, paint stores, and hardware stores:

Partner Stores:	114
Shelftalkers: (tips on paint, pesticide, and fertilizer)	121
Tearsheets: (list of HHW collection centers)	28,550
Tip cards: (tips on paint, pesticide, and fertilizer)	12,115
Poster: (identified phone number and website)	102
Fact Sheets (pollution prevention tips)	184

Listed below is a summary of the materials distributed at home improvement store tablings:

Tablings:	9
Bookmarks:	268
Coloring Books:	366
Pens:	379
Magnets: (English and Spanish)	357
Tearsheets: (list of HHW collection centers)	980
Tip Cards: (tips on paint, pesticide, and fertilizer)	237
Stormwater Pollution Brochure:	203

2.8.6 Partnership with Pet Facilities

Goals

- Continue to develop and maintain corporate and private partnerships between the County Stormwater Program and pet facilities, including pet stores, grooming facilities, animal hospitals and animal shelters.
- Continue to place public educational materials in pet facilities. Materials included posters and tip cards in English and Spanish which stressed the negative impact of pet waste to the storm drain system.

- Develop and maintain partnerships with pet stores and animal adoption agencies in order to hold tablings to communicate the stormwater pollution prevention message to pet owners.

Results

- Partnered with 142 major chain pet stores – such as PETCO and PETsMART – as well as smaller independent pet stores, veterinarian clinics, kennels, and grooming facilities to outreach to pet owners. Distributed 198 pet poster and over 2,376 pet tip cards. Trained 296 employees. (See Appendix A: p.29-45)
- Developed and maintained partnerships and staffed two (2) tablings at pet events. Distributed public educational materials including doggie bags which encouraged dog owners to pick up after their pets. Outreach specialists also spoke one-on-one with pet owners regarding stormwater pollution prevention and received 136 signed letters from San Bernardino County residents, which stated a commitment to picking up after their pets. (See Appendix A: p.52)

Listed below is a summary of the amount of materials distributed at pet event tabling:

Commitment Letters:	136
Doggie Bags:	149
Tip Cards: (reminder tip to pickup after pets)	21
Coloring Books:	71
Bookmarks:	46

2.8.7 Business Outreach

In order to further target possible stormwater polluters, the Program outreached to businesses in order to portray Best Management Practices. This included restaurants, construction companies and Homeowners Associations (HOA). For business outreach, the Program utilized Best Management Practices Brochures, which are specific to each industry and detail proper procedure to prevent stormwater pollution.

Goals

- Outreach to residents through Homeowners Associations in order to pass on information to residents about stormwater pollution and tips to prevent it.
- Outreach to restaurants and construction companies through trade publications.
- Results
- Continued to coordinate with 48 HOA's to distribute stormwater pollution information to homeowners. Packets included one "Too Toxic to Trash" Tearsheet, one "The Santa Ana River Begins at Your Door" Brochure and one "Pollution Prevention Tip Sheet." (See Appendix A: p.45-47)

- Assembled and mailed 1,017 stormwater pollution prevention information packets to HOA's to distribute to homeowners. (See Appendix A: p.45-47)
- Developed a new Industrial and Commercial Brochure.
- Prepared and mailed BMP Brochures to all cities.
- Created fact sheets and solicited them to the following trade publications: CalContractor, California Construction, California Builder, Southern California Builder, California Wine & Food and California Restaurant Bulletin

2.8.8 Regional Events

In order to reach the “do-it-yourself audience” the program targeted events where they would be present. These regional events provided an opportunity to relay the stormwater pollution prevention message by outreaching to individuals and distributed educational materials to residents.

Goals

- Coordinate with each jurisdiction to enlist cities to staff regional events.

Results

- Coordinated and enlisted cities to staff three (3) regional events, including the Inland Empire Home Remodeling and Design Show, the 21st Annual Environmental EXPO at California State University San Bernardino and the Inland Empire Home and Outdoor Living Show. (See Appendix A: p.47)
- Distributed public education materials and spoke one-on-one with residents regarding stormwater pollution prevention, outreaching to over 1,937 residents. (See Appendix: p.47)

Participants in the Inland Empire Home Remolding and Design Show included: City of Loma Linda, City of Fontana, City of Redlands, City of Montclair, City of Chino Hills and County of San Bernardino.

Participants staffing the booth at the Inland Empire Home and Outdoor Living Show included: City of Loma Linda, City of Montclair, City of Big Bear Lake, City of Rialto, City of Highland, City of Upland and County of San Bernardino.

Listed below is a summary of the materials distributed at regional events.

Bags:	744
Rulers:	570
Bookmarks:	828
Coloring Books:	876

Pens:	1805
Magnets: (English and Spanish)	867
“The Santa Ana River Begins at Your Door” Brochure:	364
Tearsheets: (list of HHW collection centers)	957
Tip Cards: (tips on paint, pesticide, and fertilizer)	1142

2.8.9 School Education

Environmental Education promotes public awareness and increases knowledge of environmental issues. The earlier that environmental education is provided, the more likely that it will have a strong effect on an individual’s values, and in turn, influence lifestyle. As such, the San Bernardino County Stormwater Program performed outreach to elementary school students by offering pollution prevention presentations to schools throughout the area.

The Malibu Foundation for Environmental Education conducted the presentations in two different types of settings, classroom and assembly. The classroom presentation is geared toward an individual grade level; whereas, the school assembly is intended to reach the entire school. The program allowed the schools the flexibility of choosing which setting they preferred.

The presentation utilizes an interactive slideshow. This interactive slideshow connects students with their surroundings, teaching them about the storm drain system and how litter in San Bernardino County impacts faraway rivers, beaches and oceans. The presentations are also a call to action. Students are encouraged to act on the lessons learned by hosting their own cleanup event.

Goals

- Coordinate with school districts to obtain approval to conduct presentations for all elementary schools in the county.
- Outreach to elementary schools to educate students about watersheds, storm drains, and sources of stormwater pollution to meet the goals and objectives of the NPDES Permit.
- Encourage teachers and students to organize a school clean-up as part of the students’ hands-on environmental education.
- Outreach to media in an effort to encourage media in San Bernardino County to write an article about the environmental school presentations.

Results

- The presentations introduced students to stormwater pollution and the impact that their actions have on the environment. It stressed responsibility and awareness within communities and the ways in which students can help improve their surroundings.

- Distributed flyers that offered free school assemblies or classroom presentations.
- Developed relationships with elementary schools through conducting school assemblies and classroom presentations.
- The Malibu Foundation conducted 35 presentations and reached 8,438 elementary school students. (See Appendix A: p.48-50)
- Over 292 students from 6 schools independently organized a school clean up to keep the community clean. A total of 203 lbs. of trash was collected during school clean up events. (See Appendix A: p.50-51)
- Sent story pitches to the following newspapers: Champion Newspapers, Precinct Reporter, Fontana Herald News, Inland Empire Community Newspapers, Inland Valley Daily Bulletin, San Bernardino Sun, Highland Community News, Big Bear Grizzly, Westside Story Newspaper, Redland Daily Facts and California Teacher's Association. (See Appendix A: p.58)
- Reporters from The Highland Community News and the Inland Empire Community Newspaper attended presentations. Both The Highland Community News, as well as the Inland Empire Community Newspaper, which is comprised of the Rialto Record, the Inland Empire Weekly, the El Chicano and the Colton Courier, published articles regarding the school presentations. (See Appendix A: p.59-61)

2.8.10 Public Information/Public Participation Forum

SGA continued to participate on behalf of the permittees to attend meetings at the Public Information/ Public Participation Forum, which is a committee of the California Stormwater Quality Association (CASQA).

Goals

- Attend PIPP Committee Meetings and share information regarding outreach efforts.
- Participate in Statewide efforts and collaborative projects.

Results

- Coordinated with CASQA and shared information regarding outreach efforts undertaken by the program.
- Attended two (2) CASQA meetings in San Diego on August 10, 2006 and January 11, 2007.

2.8.11 Stormwater Pollution Prevention Displays

Window displays showing the stormwater pollution prevention message were arranged at Permittees' City Halls or Public Libraries to reach community residents and key internal stakeholders. The displays featured educational materials that residents could take as they passed by.

Goals

- Coordinate with cities to set up stormwater pollution prevention displays at City Halls and libraries.
- Provide residents with the (800) OILY-CAT hotline and www.cleanup.org website as a source of additional information for pollution prevention.

Results

- Coordinated with the cities of Chino Hills, Ontario, Upland and Rancho Cucamonga to arrange a stormwater pollution prevention window display at their City Hall or library.

2.8.12 Advertising

Advertising in fiscal year '06-'07 consisted of outreach activities successfully established and maintained in previous years, modified to meet the needs of the current fiscal year. Program advertising consisted of radio commercials and outdoor posters, continued to build on established messages and utilized proven strategies and tactics to maximize the available budget. The campaign included bonus media and added value and met NPDES Permit requirements for minimum audience delivery as measured by gross impressions.

Goals

- Continue with established comprehensive advertising strategies to increase awareness of stormwater issues and meet permit compliance.

Results

- **Radio Advertising**
 - A total of 501 radio spots ran for six weeks over a 10-week period, from May 21 to July 29. An alternating schedule of two weeks on and two weeks off was used to create a more sustained advertising presence and extend the campaign over the key summer months of June and July.
 - Commercials aired on five top-rated English and Spanish radio stations. The stations purchased include top-rated KGGI-FM, KCAL-FM, KCXX-FM and Spanish language combination KXSB-FM/KXRS-FM.
 - Two new thirty-second radio commercials were created to air on KGGI-FM, Dog Waste (SB-07-01) and Salute (SB-07-02). Radio station KGGI-FM is owned by Clear Channel Communications, which recently switched the majority of its commercial air time on many stations from sixty-second to thirty-second units.
 - The schedule achieved an estimated 262 target ratings points (Adults 18-49). Thirty-one percent (reach percentage 31%) of Adult 18-49 radio listeners in the San Bernardino-Riverside radio market heard the radio commercials at least once and on average they heard them 8.4 times (8.4x frequency),

generating an estimated 2,705,000 gross impressions (source: Strata Scheduler, using Arbitron radio audience estimates).

- ***Outdoor Advertising***

- Outdoor advertising consisted of bus shelter posters displayed in the spring (April to June) on a pro-bono basis and a paid schedule run during summer (June to August).
- The pro-bono outdoor schedule consisted of 25 bus shelter poster locations displayed for 8 consecutive weeks, April 23 to June 17. The locations were in cities that are part of the OmniTrans system, and where open posters were available.
- The paid outdoor schedule consisted of 25 bus shelter poster locations displayed for 8 weeks over a 9-week period, June 18 to August 19. The locations were distributed across the County consistent with funding allocation percentages, similar to past outdoor campaigns. Fifty percent (50%) of the posters were in Spanish, placed in areas with a high percentage of Spanish-speaking residents.
- The paid outdoor was scheduled strategically so that the Stormwater Program received an extra week for no charge, worth approximately \$2,050.
- The outdoor advertising reached an estimated twenty-one percent (reach percentage 21%) of San Bernardino County's Adult 18-49 population. Residents who saw the posters saw them an average of 5 times (5x frequency). The outdoor campaign achieved an estimated 3,830,061 impressions (source: Outdoor Impact Analysis, Outdoor Services, Inc., based on traffic data).

- ***Newspaper Advertising***

- A new set of resized newspaper ads were created for the San Bernardino Sun and Inland Valley Daily Bulletin; both newspapers switched to modular ad sizes, requiring advertisers to submit ads in defined modular sizes or pay a premium to run non-modular ad sizes. Newspaper ads added an additional 3,045,000 gross impressions.

2.8.13 Public Relations

The public relations component of the Public Education Program continued to build a more comprehensive and consistent communications channel with local media, business associations, environmental organizations, academic institutions and key community and stakeholder groups.

Goals

- Reinforce partnerships with local media, environmental organizations, business associations, and stakeholder groups and publish news releases in their publications.

Results

- An acknowledgment letter and promotional items (pens and pencils) were mailed to local newspapers and radio stations in July, 2006, to thank them for supporting the public education program by publicizing program news and to further reinforce the relationship between the public education program and local media.

2.8.14 Material Development

The materials development portion of the public education program included the creation of new radio commercials, newspaper ads, and collateral materials and the updating and production of additional quantities of collateral and promotional items. New resource kits containing all updated outreach materials and new materials were created for all Program representatives.

Goals

- Create new materials, as well as update collateral and promotional items with current program information.

Results

- Industrial/Commercial brochure: A new brochure was created for Industrial/Commercial concerns, promoting industrial and commercial stormwater pollution prevention best management practices. The versatile brochure can also be distributed as a self mailer.
- Collateral & Promotional items: Collateral materials and promotional items were updated with current program information and reprinted, including tip cards, brochures, posters, pens and giveaway bags.

2.8.15 Website

During this period, the Program also updated, edited and added new features to the website.

Goals

- Maintain and update the San Bernardino County Stormwater Program website.

Results

- Updated information on website as well as edited website with meeting information on permittee page and adjusted style items
- Set up FTP folders for graphic file transfers.
- Created calendar for permittee page, which provides information on upcoming Public Education Subcommittee Meetings and General Committee Meetings.

Section 3. County of San Bernardino 2006/07 Stormwater Monitoring Program – DRAFT

3.1 Summary of FY 2006/07 Monitoring Efforts

The Monitoring program for the San Bernardino County Stormwater Program includes monitoring of stormwater runoff and receiving waters in the Santa Ana River drainage basin and analysis of the resultant monitoring data. In this chapter, the results from Fiscal Year (FY) 2005/06 monitoring are presented. The character of stormwater in San Bernardino County's Santa Ana River drainage is compared to stormwater quality in other communities in California and across the nation. In addition, the results of the 2005/06 monitoring season are compared to water quality objectives.

This report summarizes information on the following:

Stormwater Monitoring Coalition Studies

Stormwater Discharge (Main Program and First Flush)

Receiving Water

Results are presented in a format similar to that used in past years. Dry weather samples have not been collected since July 1998 and are therefore not assessed this year.

This chapter also includes recommendations for modifying the monitoring program, including the implementation of a Pollutant Source Investigation and Control Plan.

3.1.1 Stormwater Monitoring Coalition

As a result of the increasing regulatory focus and the lack of scientific knowledge base, both stormwater regulators and municipal stormwater management agencies throughout southern California have developed a collaborative working relationship. The goal of this relationship is to develop the technical information necessary to better understand stormwater mechanisms and impacts, and then develop the tools that will effectively and efficiently improve stormwater decision-making. As individuals and agency representatives, there was early recognition that these issues are oftentimes not localized, but typically cross watershed and jurisdictional boundaries. This relationship culminated in a formal letter of agreement, signed in 2000, by all of the Phase I municipal stormwater NPDES lead permittees and the NPDES regulatory agencies in southern California to create the Stormwater Monitoring Coalition (SMC) (See list of member agencies below).

The SMC has been so successful that the member agencies have decided to renew the letter of agreement for another five years. Moreover, the organization's appeal has been recognized by others, resulting in three new member agencies. The new agencies include California Department of Transportation (Caltrans), the City of Los Angeles, and the State Water Resources Control Board. The SMC welcomes these new members and looks forward to working together.

List of member agencies in the Stormwater Monitoring Coalition.

California Regional Water Quality Control Board, Los Angeles Region¹
 California Regional Water Quality Control Board, San Diego Region¹
 California Regional Water Quality Control Board, Santa Ana Region¹
 California Department of Transportation, Caltrans
 City of Long Beach¹
 City of Los Angeles, Watershed Protection Division
 County of Orange, Public Facilities and Resources Dept.¹
 County of San Diego Stormwater Management Program¹
 Los Angeles County Department of Public Works¹
 Riverside County Flood Control and Water Conservation District¹
 San Bernardino County Flood Control District¹
 Southern California Coastal Water Research Project¹
 State Water Resources Control Board
 Ventura County Watershed Protection District¹

¹ original SMC member agency

The first project supported by the SMC was to develop a five-year Research Agenda. The research agenda, published in 2001, consisted of 15 unique projects developed around three main foci: 1) developing a regional monitoring infrastructure; 2) understanding stormwater runoff mechanisms and processes; and 3) assessing receiving water impacts. The SMC has made tremendous progress implementing the Research Agenda. Nine of the 15 projects have been started and nearly all have been completed. Each of these projects has, in one form or another, influenced stormwater management. Three examples of the SMC's influence include: 1) the project on evaluating microbial source tracking (MST) has led to a significant change in how MST is conducted in southern California; 2) the project on indicators of peak flow directly influenced the development of peak flow criteria in Los Angeles; 3) the project to establish standardized data formats has led to language in multiple stormwater NPDES permits requiring electronic data submittal. The SMC is currently developing an agreement to update and revise the research agenda. This will provide vision and direction to the SMC for the next five years.

Not only does the collaborative nature of SMC projects represent value in terms of improved effectiveness of management activities, but value in terms of cost efficiency to its member agencies. All of the completed SMC projects have been on time and on (or under) budget. The cost of the studies is divided among multiple agencies rather than each agency trying to support individual isolated projects. In addition, the SMC has been successful in attracting outside resources and agency support. For example, all but a single project has attracted additional funds amounting to well over \$700,000. In addition, we have received in-kind assistance from inland wastewater dischargers, environmental groups, universities, and

regulatory or stormwater agencies that are not currently SMC members. The power of collaboration should magnify as the SMC continues to be successful in accomplishing its goals. Project accomplishments during FY2006/07 Fiscal Year are listed below, and described in detail the SMC Annual Report (provided on the enclosed CD).

• **Participation in the Stormwater Monitoring Coalition**

The Permit (Monitoring and Reporting Program III.6 and III.7) requires the Permittees to cooperate with the Southern California Coastal Water Research Project (SCCWRP) in regional monitoring and assessment efforts. The District participates on behalf of the Permittees in the Southern California Stormwater Monitoring Coalition (SMC) that operates in cooperation and with guidance from SCCWRP. Recent and ongoing work by the SMC includes the following:

Ongoing Studies:

▪ **Reference Bacteria Study**

This project is assessing natural bacteria levels in numerous streams throughout southern California in order to provide a regional characterization of background bacteria concentrations. The outcome of this study may help develop numeric targets for multiple watersheds that account for natural background levels of bacteria.

▪ **Building a Regionally Consistent and Integrated Freshwater Stream Bioassessment Monitoring Program**

The approach for building a regionally consistent bioassessment monitoring program has three phases, including: 1) methods standardization; 2) calibrating and validating a regional assessment tool; and 3) designing and implementing an integrated, coordinated regional monitoring program.

The SMC is a funding partner in this study that is being conducted by SCCWRP and the California Department of Fish & Game. Bioassessment guidance is available as of this report date.

▪ **Laboratory Intercalibration**

This study will develop performance-based quality assurance and quality control criteria for ongoing stormwater testing throughout the region. Laboratories that wish to analyze stormwater samples on behalf of SMC member agencies in the future are required to verify that they can meet the performance-based criteria developed as part of this intercalibration study.

▪ **LID Guidance and Training Project**

This project will assess the effectiveness of low impact development techniques for pollutant removal and hydromodification reduction for projects in southern California. This project began in December 2006.

3.1.2 TMDL Monitoring Programs

Implementation of TMDL monitoring programs will be a continuing and significant effort for the Stormwater Program. In FY 2006/07, monitoring plans were developed and approved for the MSAR TMDL. This consists of a “Watershed Wide Monitoring Plan (WWMP)” and an “Urban Source Evaluation Plan (USEP).” These monitoring efforts were initiated late in June 2007, so results are not being reported herein. However, we expect to include these results in future Stormwater Program Annual Reports.

The Big Bear Lake Nutrient TMDL for Dray Weather Conditions will have monitoring plans in place during FY 2007/08, and any results will also be reported in subsequent Stormwater Program Annual Reports.

3.1.3 Site Descriptions

During FY 2006/07, three stormwater discharge sites and two receiving water sites were monitored. A map of these sites is provided as **Figure 3.1.1**. The three stormwater discharge monitoring sites were selected to provide data to characterize runoff from urban development and agricultural practices. Site characteristics for the FY 2006/07 monitoring stations are summarized in **Tables 3-1 and 3-2**. Samples for Sites 2 and 3 were collected from within Cucamonga Creek. Although the creek is concrete-lined as it passes through the urban area, it nonetheless constitutes a receiving water body; therefore, Sites 2 and 3 are technically receiving water monitoring sites. However, they are considered to be stormwater discharge sites for the purpose of this monitoring effort. The creek water at Site 2 is predominantly composed of urban runoff, but some portion of the creek flow at this location is also derived from upstream open space/rural and residential land uses. Similarly, although the predominant land use in the vicinity of Site 3 is agricultural, the creek flow at Site 3 is affected by a mixture of land uses, including open space/rural and discharge from a municipal wastewater treatment plant located between Sites 2 and 3. Site 5 is a stormwater discharge monitoring station; the samples for Site 5 are collected from within the constructed storm drain system (via a maintenance hole) prior to discharge to the receiving water. The two receiving water sites were located on the Santa Ana River at Hamner Avenue (Site R-1 or 8) and upstream of the Seven Oaks Dam tributary (Site R-3 or 10).

Table 3-1: Stormwater Monitoring Site Characteristics

Site No.	Location	Primary Land Use	Nearest SBCFCD Rain Gauge	Station Number
2 ^a	Cucamonga Creek @ Hwy 60	Commercial and Industrial	Ontario Fire Station #3	1335
3 ^a	Cucamonga Creek @ Hellman Ave.	Agriculture	Chino County Airport	1360
5	Stormwater pipe @ Hunts Lane north of Hospitality Lane	Commercial and light industrial	SBCFCD Office	2001B3

Note:

a. Samples collected from these sites are technically considered to be from receiving waters.

Table 3-2: Receiving Water Monitoring Site Characteristics

Site No.	Location	Primary Land Use	Nearest SBCFCD Rain Gauge	Station Number
R-1 (8)	Santa Ana River @ Hamner Ave.	Urbanized	Chino County Airport	1360
R-3 (10)	Santa Ana River upstream of Seven Oaks Dam tributary	Open/Rural	Santa Ana P.H.	3162

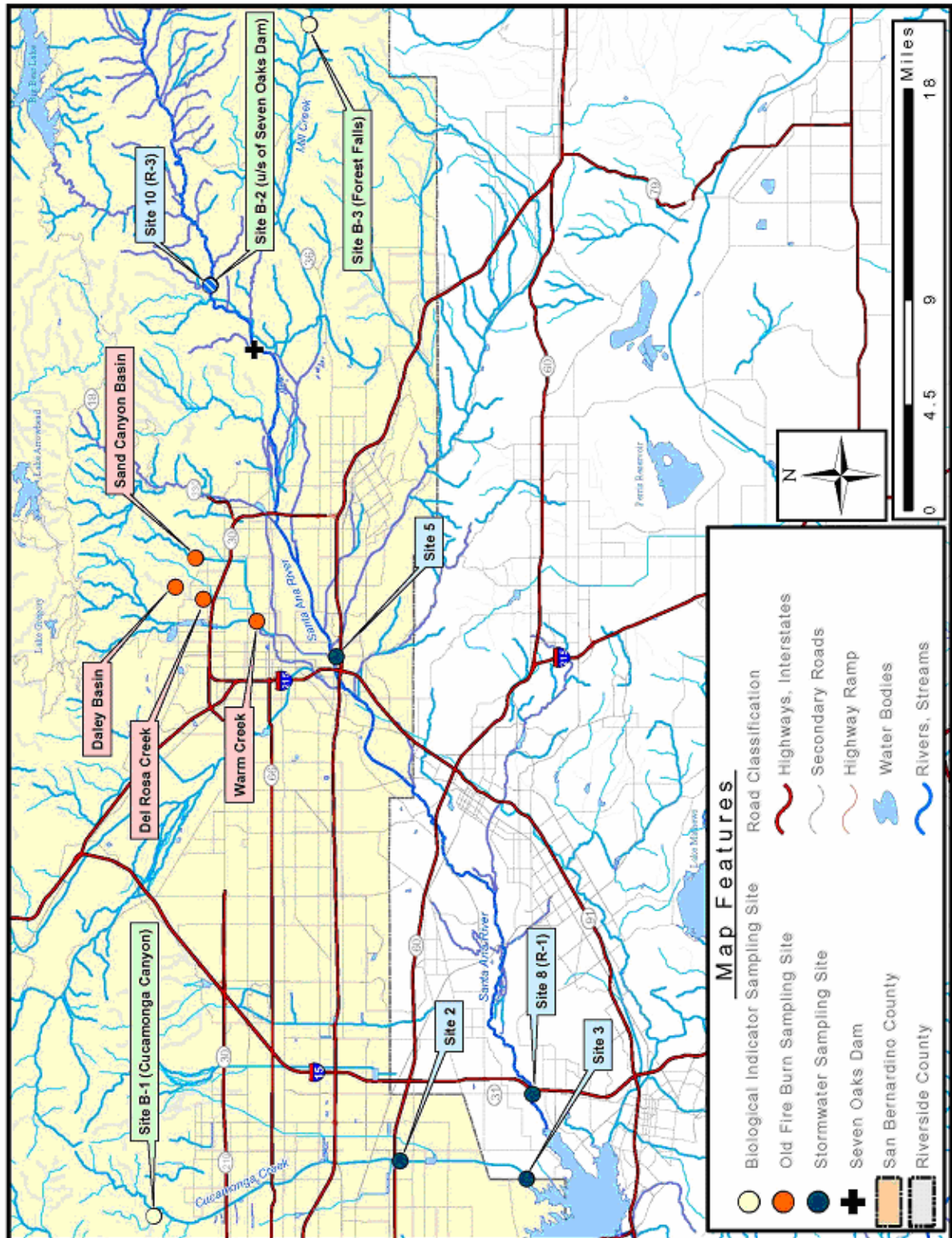
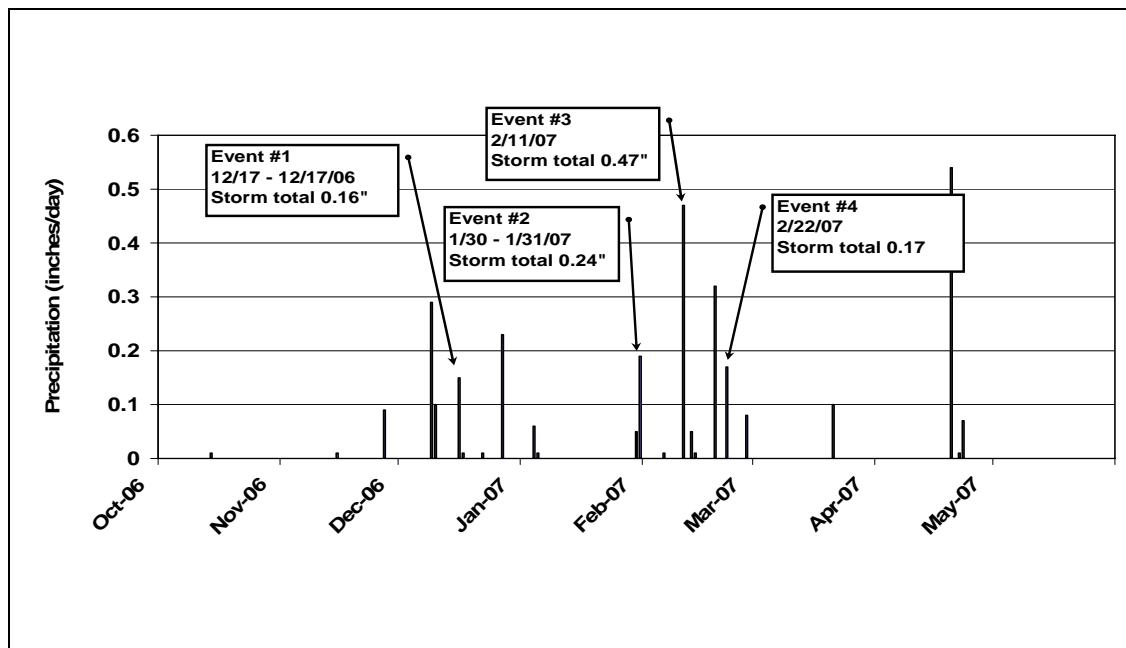


Figure 3.1.1
Santa Ana River Basin Sampling Sites

3.1.4 Precipitation

Recorded daily precipitation from Weather Station 1335 (located at Ontario Fire Station No. 3) and the dates of the monitored events for FY 2006/07 are depicted in Figure 3-2. A summary of total monthly rainfall during the 2006/07 stormwater monitoring season is shown in **Table 3-3** for SBCFCD rain gauge stations located near the monitoring sites. Daily precipitation data for all SBCFCD rainfall gauging stations can be retrieved from the SBCFCD website.¹ Total annual rainfall totals for the sites listed in **Table 3-3** were an average of 30 percent of their average annual rainfall totals (based on reliable data available from 1980/81 to 2004/05); using these data, FY 2006/07 can be characterized as a water year that was far below normal.

A comparison of sample collection dates to the seasonal precipitation record indicates that during the 2006/07 wet season, data from four representative storms were successfully captured. Storm event sampling criteria specify that not more than 0.1 inch of rain can fall during the 72 hours preceding a monitored event. The minimum rainfall event level was set at 0.25 inches. Antecedent rainfall conditions for the 2006/07 sampling events are provided in **Table 3-4**.



*Figure 3.1.2
Daily Precipitation and FY 2006-07 Monitoring Events*

¹ <http://www.co.san-bernardino.ca.us/trnsprtn/pwg>

Table 3-3: Inches of Rainfall in Drainage Area for FY 2006/07

Month	SBCFCD Rain Gauge Station					
	1335 Ontario Fire Station #3	1360A Chino Airport	1376 Cucamonga Creek @ Baseline	2001B3 SBCFCD Offices	2361 Del Rosa Fire Dept.	3162 Santa Ana P.H.
Oct-06	0.01	0	0.02	M	2.75	0.44
Nov-06	0.10	0.70	0.20	0.19	0.35	0.15
Dec-06	0.79	1.07	0.91	0.62	0.78	1.01
Jan-07	0.31	0.09	0.57	1.12	0.900	0.94
Feb-07	1.11	0.70	2.00	0.65	1.07	1.54
Mar-07	0.10	0.06	0.11	0	0.05	0.82
April-07	0.62	0.54	0.76	0.95	M	0.89
May-07	0	0.01	0	0	M	0.06
Total Inches	3.04	2.54	4.57	3.53	5.90	5.85

M = missing data

Table 3-4: Antecedent Rainfall Conditions for the 2006/07 Wet Season

Antecedent Conditions ¹	Stormwater Sampling Events			
	Event 1 12/16/06	Event 2 1/31/07	Event 3 2/12/07	Event 4 2/22/07
Time of First Rain	12/16/06	1/30/07	2/11/07	2/22/07
Time of Last Rain	12/17/06	1/31/07	2/11/07	2/22/07
Total Rainfall (in.) for this event ²	0.16	0.24	0.47	0.17
Time of last precipitation	12/10/06	1/05/07	2/06/07	2/19/07
Time since last precipitation	5 days	24 days	4days	3days
Date of last storm \geq 0.1 in.	12/10/06	12/27/06	1/31/07	2/19/07
Time since last storm \geq 0.1 in.	5 days	33days	10 days	3 days
Date of Last Storm \geq 0.25 in.	12/09/06	12/27/06	12/09/06	2/19/07
Time since last storm \geq 0.25 in.	6 days	33 days	63 days	3 days
Cumulative rainfall for season (in.)	0.66	1.23	1.71	2.26

1 = Wet season data from Weather Station 1335 (Ontario Fire Station #3)

2 = The precipitation was totaled for the entire storm, not the 3-hour event monitored.

3.1.5 Sample Collection

The monitoring program for San Bernardino County stormwater discharge characterization sites consists of two parts: monitoring the “First Flush” (the first 30 minutes of storm runoff) and the “Main Program” (the subsequent 2.5 hours of storm runoff). The First Flush and Main Program samples are collected as time-weighted composite samples. In the course of three hours, 24 discrete 350-mL samples are collected. Samples 1 through 14 are taken during the first half hour, at one to three minute intervals. The first sample is discarded, and the remaining samples are composited as a single First Flush sample for each site per storm event. The remaining ten samples are taken at 15 minute intervals and composited as a single Main Program sample for each site and each storm event. The receiving water samples are collected as single grab samples, one per site per storm event.

In addition, the County has acquired new automated samplers and is transitioning to a flow-paced methodology at the automated stations, as recommended by the SMC’s Model Monitoring Guidance. Comparative dual sampling has been implemented at selected sites so that a correlation between the new flow-paced and current time-paced sampling methods can be established. For FY 2006/07, dual sampling was attempted at Site 2 and 3. However, due in part to the small storms, the samplers did not trigger as intended. Therefore, the results include time and flow-paced composites that are not accompanied by Main Program and First Flush samples. During FY 2007/08, dual sampling will take place at Site 2, if possible.

Sampling methods and sample handling procedures used in the monitoring program were generally consistent with procedures described in the Stormwater System and Receiving Waters Monitoring Program (SBCFCD, January 1993) as amended in the Report of Waste Discharge (SBCFCD, April 1995). The primary differences between the two source documents are the number of storms to be monitored and the use of lower detection limits for selected parameters. Over the years, certain monitoring constituents have been eliminated due to a preponderance of “non-detect” results. The number of sites monitored on a routine basis also has been reduced following analysis of the accumulated monitoring data.

Results obtained for the Main Program composite samples are assumed to be roughly representative of the Event Mean Concentration (EMC) values for individual sites and storms. Such an approach provides for a conservative estimate (i.e., the true EMC is likely less than the Main Program composite sample) in assessing the potential impact on the receiving water from urban runoff.

Samples collected and analyzed during FY 2006/07 are summarized in **Table 3-5**. Four storms were monitored during FY 2006/07. Three storms were fully monitored at each of the sites.

The first storm that was sampled occurred on December 16-17, 2006, but the automatic sampler at Site 3 did not receive sufficient flow to be triggered during the storm and was only sampled for bacterial indicators after the storm was over. The first storm fully sampled in FY 2006/07 occurred on January 30-31, 2007. First Flush and Main Program composite samples were collected at Sites 2 (12/16/06; 1/31/07; 2/12/07) and 5 (all four events). Grab samples were collected at receiving water Sites 8 and 10 (**Table 3-5**). Other composite samples were

collected with time-paced (CT) and flow-paced (CF) programs which are under development to replace the first-flush and main program method. These methods will be described in detail in the revised standard operating procedure manual, but are being implemented to collect samples that are more representative of the EMC.

Table 3-5: Samples Collected During the 2006/07 Wet Season

Stormwater Sampling Event Date	Monitoring Sites				
	2	3	5	8	10
12/16/2006	C/C	B	C/C	G	G
1/30-1/31//2007	C/C	CT	C/C	G	G
2/12/2007	C/C	CF	C/C	G	G
2/22/2007	Cff, CF, CT	CF	C/C	G	G

Notes:

B: Bacteria samples only collected

C/C: Composite sample for First Flush / Composite sample for Main Program

G: Grab sample

Cff: Composite Sample for first flush only

CF: Flow-Paced Composite Sample

CT: Time-Paced Composite Sample

NS: Samples were not collected at this site.

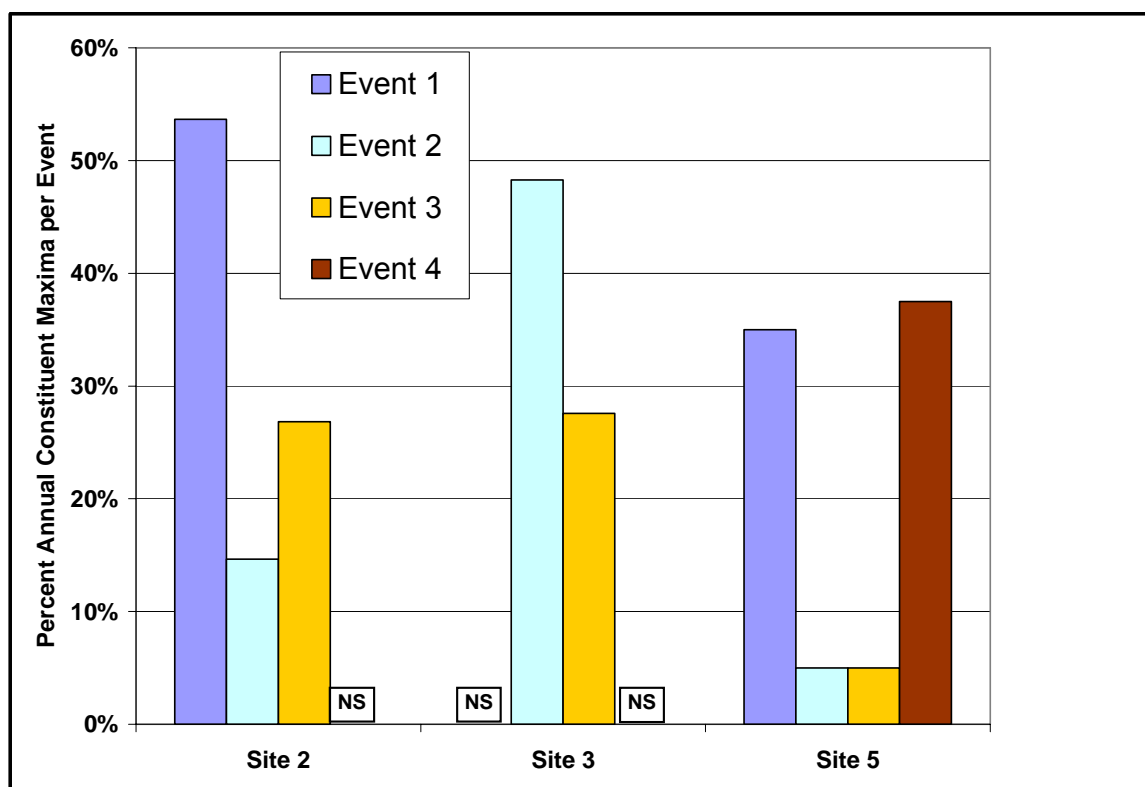
1. Event 1: First Flush and Main Program Samples were not collected due to insufficient flow at Site 3.

3.2 Summary of Results – Stormwater Quality in Santa Ana River Drainage

Higher pollutant concentrations are often observed in urban runoff during the first storms of the season. This may reflect a process of build-up and wash-off wherein pollutants accumulate on land surfaces during prolonged dry periods and wash off land surfaces during subsequent storms. The first storms of the wet season may tend to wash off much of the pollutant load that accumulated during the dry summer months. For 2006/07, the monitored storms were smaller than would be statistically “typical” based on past monitoring data. Therefore the buildup/washoff processes may be less obvious in sample data for this year. The sampled storm events appear to have captured the range of the storm season, but the very first storm was not expected to produce sufficient rain amounts and was therefore not sampled.

In addition, both storm intensity and antecedent rainfall conditions may affect the concentrations of pollutants seen in urban runoff during storm events throughout the wet season. It is also possible that light rains may not wash away pollutants as effectively as larger storms, so the amount of rain that falls in any event can also impact pollutant concentrations.

The fractions of measured constituents exhibiting an annual maximum value during each of the four monitored storms events of 2006/07 are displayed in **Figure 3.2.1**. Results are shown for Main Program samples from Sites 2, 3, and 5. Bacteria maxima are excluded and displayed instead in **Figure 3.2.2**. While all three sites include urban runoff in their sample streams, Sites 2 and 3 are located in receiving waters (Cucamonga Creek), and samples collected at Site 5 comprise stormwater discharge from commercial/industrial land use.



Note: Sites 2 and 3 were not sampled for Event 4; Site 3 was also not sampled for event 1.

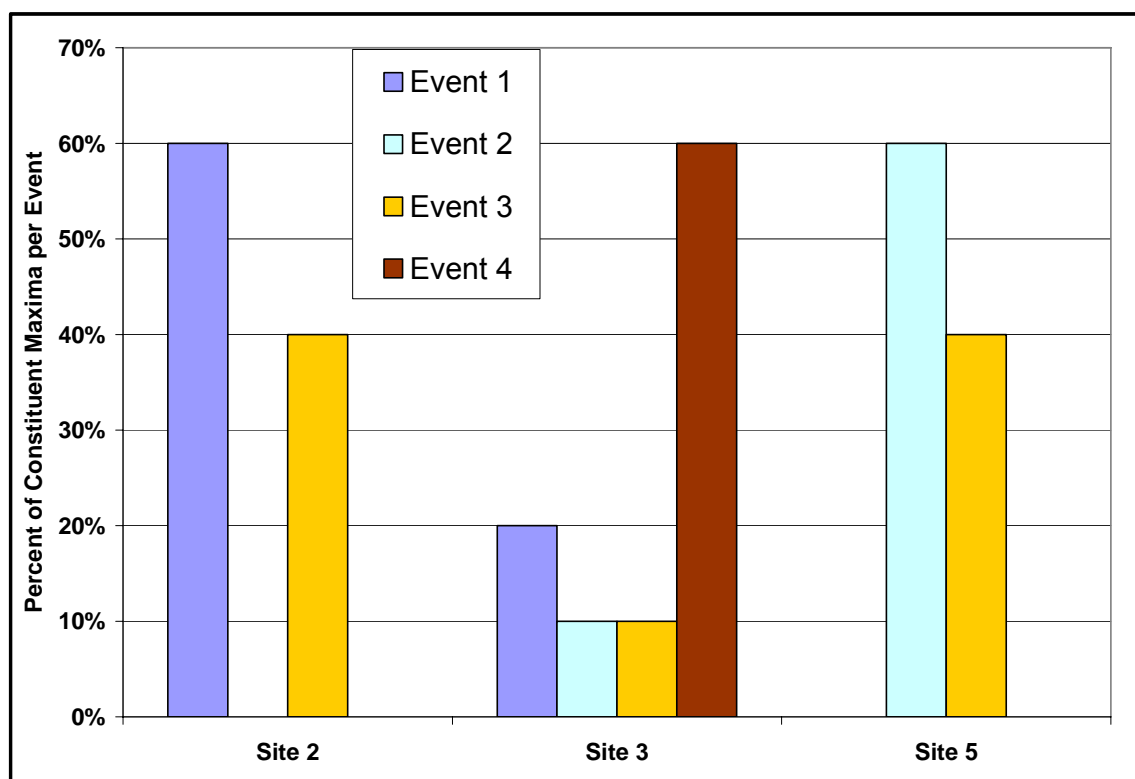
*Figure 3.2.1
Distribution of Pollutant Maximum Concentrations during FY 2006/07(Main Program)*

A seasonal build-up/wash-off effect has been observed in monitoring data from previous years, but with the exception of Site 2, such a trend is not evident from the data collected during the 2006/07 season. Instead, the percentages of constituent maxima observed for samples collected at Site 3 are greatest during Event 2 (48%). However, the fraction of measured constituents exhibiting an annual maximum value at Site 5 was greatest during Event 4 (38%). This may be due to the fact that all the monitored storms were relatively small events.

It can be seen in **Table 3-4** and **Figure 3.1.2** that the first rainfall of the season was not sampled, but all storm events were relatively small. Event 3 has the largest amount of rainfall in one day and was preceded by four dry days. Event 2 had the largest number of antecedent dry days (24 days), but had very little rainfall. It is difficult to make definitive conclusions regarding the influence of the accumulation of pollutants, rainfall to date, and storm intensity.

Total coliform, *E. coli* and enterococcus concentrations were measured at Sites 2, 3, and 5 for all four storm events. In addition, fecal coliform and fecal streptococcus were measured at each site for Events 1 through 4. A build-up and wash-off effect is not clear for indicator bacteria concentrations (see **Figure 3-4**). Event 1 occurred 5 days after the last storm with greater than 0.25 inches of rainfall. Based on visual observation, the fraction of indicator bacteria maxima per event at each site does not parallel the fraction of other constituent

maxima per event (see **Figures 3.2.1 & 3.2.2**). During Event 1, the fraction of maxima is high at Site 2 for both indicator bacteria and other constituents (54% and 60%, respectively). During Events 2 and 3, Site 5 results show a high fraction of indicator bacteria maxima and a low fraction of other constituent maxima. At Site 3, 60% of indicator bacteria maxima occur during Event 4. As stated in the earlier discussion regarding pollutant build-up, rainfall to date, and rainfall intensity, it is difficult to develop conclusions regarding factors that influence bacteria levels. We hope to learn more about interpretation of bacterial indicator sample results through the MSAR TMDL monitoring program.



Note: All sites were sampled for all events. If no bar is evident on plot, no maxima occurred at a particular site for a particular event.

Figure 3.2.2
Distribution of Bacteria Constituent Maximum Concentrations During FY 2006/07 (Main Program)

Analytical results from the four sampled storms of FY 2006/07 at each stormwater discharge site are presented in **Tables 3-6, 3-8, and 3-10** for the First Flush sample data and **Tables 3-7, 3-9, and 3-11** for the Main Program sample data. Analytical results from the four sampled storms of FY 2006/07 for each of the two receiving water sample sites are presented in **Tables 3-12 and 3-13**. Data for each site monitored during the individual wet-weather storm events for FY 2006/07 are available in tabular form from SBCFCD.

Laboratory data results from the FY 2006/07 sample analysis are essentially consistent with data from previous years in terms of accuracy, but method detection limits have decreased. For silver, cadmium, and lead in particular, method detection limits have decreased by orders of magnitude.

Table 3-6: 2006/07 Wet Weather Results for Site 2 (First Flush)

Constituents ¹	Event 1	Event 2	Event 3	Event 4
Conventional				
BOD	43	32	NS	34
COD	390	220	NS	170
pH (units)	7.3	7.8	NS	7.5
EC (μmhos/cm)	290	290	NS	180
TDS	180	170	NS	130
TSS	300	300	NS	130
O&G	5.5	36	NS	<1.5
Metals (Total Recoverables)				
Ag	<0.031	<0.031	NS	<0.031
As	5.1	<1.6	NS	<1.6
B	110	<17	NS	<17
Ba	240	160	NS	98
Cd	<0.077	<0.077	NS	<0.077
Cr	23	<0.14	NS	<0.14
Cu	140	65	NS	38
Fe	14000	9300	NS	5600
Hg	<0.032	<0.032	NS	<0.032
Mn	320	200	NS	100
Pb	33	19	NS	11
Se	<2.3	<2.3	NS	<2.3
Zn	630	280	NS	210
General Minerals				
Total Hardness ²	120	110	NS	62
Ca	35	30	NS	18
Mg	8.5	7.9	NS	3.9
Na	25	23	NS	14
K	10	7.5	NS	4.5
Total Alkalinity ²	60	78	NS	46
OH	<3.4	<1.7	NS	<1.7
CO ₃	<3.4	<1.7	NS	<1.7
HCO ₃	73	95	NS	56
Other				
SO ₄	16	15	NS	10
Cl	23	20	NS	9.0
F	0.5	0.4	NS	0.1
P-Ortho	0.32	0.15	NS	<0.0062
P-Total	1.3	1.4	NS	<0.06
NH ₄ -N	1.9	1.2	NS	0.97
NO ₂ -N	0.25	0.26	NS	0.16
NO ₃ -N	3.5	2.7	NS	2.6
TKN	16	9.5	NS	4.5
N-Total	20	12	NS	7.3

Notes:

1. Units are mg/L unless otherwise noted.

2. Hardness and Alkalinity are reported as Mg/L of CaCO₃.

NS: Constituent was not sampled.

Table 3-7: 2006/07 Wet Weather Results for Site 2 (Main Program)

Constituents ¹	Event 1	Event 2	Event 3	Event 4
Conventional				
BOD	22	12	14	<5
COD	140	70	140	52
pH (units)	7.3	8.3	7.5	7.7
EC (μmhos/cm)	160	240	93	110
TDS	110	150	59	74
TSS	98	31	110	80
O&G	NS	NS	NS	NS
Metals (Total Recoverables)				
Ag	<0.031	<0.031	<0.031	<0.031
As	<1.6	<1.6	<1.6	<1.6
B	<17	<17	<17	<17
Ba	73	45	60	73
Cd	<0.077	<0.077	<0.077	<0.077
Cr	<0.14	<0.14	<0.14	<0.14
Cu	41	16	41	22
Fe	4400	830	3900	5200
Hg	<0.032	<0.032	<0.032	<0.032
Mn	90	29	72	82
Pb	<0.084	<0.084	<0.084	<0.084
Se	<2.3	<2.3	<2.3	<2.3
Zn	230	72	150	110
General Minerals				
Total Hardness ²	50	76	32	41
Ca	14	23	9.3	12
Mg	3.5	4.4	2.2	2.9
Na	12	17	5.1	6.9
K	5.8	3.0	3.1	2.9
Total Alkalinity ²	32	63	24	39
OH	<3.4	<1.7	<1.7	<1.7
CO ₃	<3.4	<1.7	<1.7	<1.7
HCO ₃	39	77	29	48
Other				
SO ₄	6.8	11	3.4	4.0
Cl	10	11	2.5	3.5
F	0.3	0.2	0.1	0.1
P-Ortho	0.28	0.14	0.19	0.083
P-Total	0.65	0.55	0.50	0.32
NH ₄ -N	1.3	0.87	1.2	0.54
NO ₂ -N	0.15	<0.0017	<0.0017	<0.0017
NO ₃ -N	1.6	3.0	1.0	0.84
TKN	4.4	2.9	3.1	1.5
N-Total	6.2	5.9	4.1	2.3
Microbiology (MPN/100 mL)				
Total Coliform	30000	9000	<200	14000
Fecal Coliform	5000	400	1700	2200
E. coli	5000	400	1700	2200
Fecal Strptococcus	17000	2300	50000	7000
Enterococcus	5000	2300	50000	5000

Notes:

1. Units are mg/L unless otherwise noted.

2. Hardness and Alkalinity are reported as mg/L of CaCO₃.

NS: Constituent was not sampled.

Table 3-8: 2006/07 Wet Weather Results for Site 2 (Flow Paced)

Constituents ¹	Event 1	Event 2	Event 3	Event 4
Conventional				
BOD	NS	NS	NS	12
COD	NS	NS	NS	93
pH (units)	NS	NS	NS	7.5
EC (μmhos/cm)	NS	NS	NS	94
TDS	NS	NS	NS	48
TSS	NS	NS	NS	150
O&G	NS	NS	NS	NS
Metals (Total Recoverables)				
Ag	NS	NS	NS	<0.031
As	NS	NS	NS	<1.6
B	NS	NS	NS	<17
Ba	NS	NS	NS	80
Cd	NS	NS	NS	<0.077
Cr	NS	NS	NS	<0.14
Cu	NS	NS	NS	25
Fe	NS	NS	NS	5400
Hg	NS	NS	NS	<0.032
Mn	NS	NS	NS	88
Pb	NS	NS	NS	<0.084
Se	NS	NS	NS	<2.3
Zn	NS	NS	NS	140
General Minerals				
Total Hardness ²	NS	NS	NS	34
Ca	NS	NS	NS	9.3
Mg	NS	NS	NS	2.6
Na	NS	NS	NS	6.0
K	NS	NS	NS	2.9
Total Alkalinity ²	NS	NS	NS	17
OH	NS	NS	NS	<1.7
CO ₃	NS	NS	NS	<1.7
HCO ₃	NS	NS	NS	21
Other				
SO ₄	NS	NS	NS	3.5
Cl	NS	NS	NS	2.7
F	NS	NS	NS	<0.01
P-Ortho	NS	NS	NS	0.21
P-Total	NS	NS	NS	0.40
NH ₄ -N	NS	NS	NS	0.58
NO ₂ -N	NS	NS	NS	<0.0017
NO ₃ -N	NS	NS	NS	0.86
TKN	NS	NS	NS	2.3
N-Total	NS	NS	NS	3.2

Notes:

1. Units are mg/L unless otherwise noted.

2. Hardness and Alkalinity are reported as Mg/L of CaCO₃.

NS: Constituent was not sampled.

Table 3-9: 2006/07 Wet Weather Results for Site 3 (Flow Paced)

Constituents ¹	Event 1	Event 2	Event 3	Event 4
Conventional				
BOD	NS	NS	NS	NS
COD	NS	160	160	110
pH (units)	NS	NS	NS	NS
EC (μmhos/cm)	NS	NS	NS	NS
TDS	NS	220	110	120
TSS	NS	NS	86	NS
O&G	NS	0	NS	NS
Metals (Total Recoverables)				
Ag	NS	<0.031	<0.031	<0.031
As	NS	<1.6	<1.6	<1.6
B	NS	<17	<17	<17
Ba	NS	74	110	71
Cd	NS	<0.077	<0.077	<0.077
Cr	NS	<0.14	<0.14	<0.14
Cu	NS	28	41	23
Fe	NS	3600	7200	4500
Hg	NS	<0.032	<0.032	<0.032
Mn	NS	94	140	79
Pb	NS	<0.084	14	<0.084
Se	NS	<2.3	<2.3	<2.3
Zn	NS	140	230	130
General Minerals				
Total Hardness ²	NS	86	NS	59
Ca	NS	25	26	17
Mg	NS	5.6	4.8	4.1
Na	NS	29	14	20
K	NS	6.7	5.1	5.7
Total Alkalinity ²	NS	NS	NS	NS
OH	NS	NS	NS	NS
CO ₃	NS	NS	NS	NS
HCO ₃	NS	NS	NS	NS
Other				
SO ₄	NS	18	10	11
Cl	NS	28	7.8	18
F	NS	NS	NS	NS
P-Ortho	NS	0.12	<0.0062	<0.0062
P-Total	NS	1.3	<0.06	<0.11
NH ₄ -N	NS	0.93	1.9	0.35
NO ₂ -N	NS	0.31	0.14	<0.0017
NO ₃ -N	NS	2.6	1.8	1.9
TKN	NS	8.2	7.2	3.9
N-Total	NS	11	9.1	5.8
Microbiology (MPN/100 mL)				
Total Coliform	9000	50000	50000	11000
Fecal Coliform	800	400	700	1700
E. coli	800	400	<200	1700
Fecal Strptococcus	22000	1300	2300	7000
Enterococcus	2600	1300	2300	5000

Notes:

1. Units are mg/L unless otherwise noted.

2. Hardness and Alkalinity are reported as mg/L of CaCO₃.

NS: Constituent was not sampled.

Table 3-10: 2006/07 Wet Weather Results for Site 5 (First Flush)

Constituents ¹	Event 1	Event 2	Event 3	Event 4
Conventional				
BOD	14	24	28	43
COD	81	1800	400	270
pH (units)	7.6	7.9	7.5	7.5
EC (μmhos/cm)	240	120	140	230
TDS	160	53	120	180
TSS	14	220	220	120
O&G	<1.5	<1.5	9.2	7.0
Metals (Total Recoverables)				
Ag	<0.031	<0.031	<0.031	<0.031
As	<1.6	7.2	<1.6	<1.6
B	<17	<17	<17	110
Ba	28	410	100	94
Cd	<0.077	<0.077	<0.077	<0.077
Cr	<0.14	45	<0.14	<0.14
Cu	17	160	48	43
Fe	780	31000	7000	5300
Hg	<0.032	<0.032	<0.032	<0.032
Mn	33	590	140	110
Pb	<0.084	93	21	14
Se	<2.3	<2.3	<2.3	<2.3
Zn	83	1300	290	260
General Minerals				
Total Hardness ²	88	170	61	94
Ca	28	45	18	29
Mg	4.2	14	4.0	5.2
Na	12	8	6.7	13
K	4.8	11	4.7	5.1
Total Alkalinity ²	56	34	36	52
OH	<3.4	<1.7	<1.7	<1.7
CO ₃	<3.4	<1.7	<1.7	<1.7
HCO ₃	68	41	44	63
Other				
SO ₄	22	10	7.7	23
Cl	7.9	4	4.0	9.6
F	0.3	0.2	0.2	0.3
P-Ortho	0.34	0.052	0.36	0.16
P-Total	0.51	15	1.6	0.95
NH ₄ -N	0.51	1.5	1.8	1.7
NO ₂ -N	0.12	0.11	0.19	0.17
NO ₃ -N	1.2	1.4	1.4	1.6
TKN	2.2	36	7.0	5.9
N-Total	3.5	38	8.6	7.7

Notes:

1. Units are mg/L unless otherwise noted.

2. Hardness and Alkalinity are reported as Mg/L of CaCO₃.

NS: Constituent was not sampled.

Table 3-11: 2006/07 Wet Weather Results for Site 5 (Main Program)

Constituents ¹	Event 1	Event 2	Event 3	Event 4
Conventional				
BOD	22	11	16	ND
COD	200	77	100	68
pH (units)	7.4	7.8	7.6	<1.0
EC (μmhos/cm)	190	200	170	240
TDS	120	91	130	10
TSS	160	62	24	150
O&G	NS	NS	NS	NS
Metals (Total Recoverables)				
Ag	<0.031	<0.031	<0.031	<0.031
As	<1.6	<1.6	<1.6	<1.6
B	<17	<17	<17	<17
Ba	99	51	34	43
Cd	<0.077	<0.077	<0.077	<0.077
Cr	<0.14	<0.14	<0.14	<0.14
Cu	51	18	20	10
Fe	6300	2700	1200	790
Hg	<0.032	<0.032	<0.032	<0.032
Mn	140	70	38	23
Pb	36	10	<0.084	<0.084
Se	<2.3	<2.3	<2.3	<2.3
Zn	370	110	86	55
General Minerals				
Total Hardness ²	83	70	58	150
Ca	25	22	19	49
Mg	4.9	4.0	2.4	7.3
Na	11	11	6.8	18
K	6.2	3.8	3.5	4.6
Total Alkalinity ²	48	49	47	100
OH	<3.4	<1.7	<1.7	<1.7
CO ₃	<3.4	<1.7	<1.7	<1.7
HCO ₃	59	60	57	120
Other				
SO ₄	15	19	9.1	57
Cl	9.9	8.4	3.7	15
F	0.3	0.2	0.2	0.3
P-Ortho	0.32	0.17	0.31	0.27
P-Total	0.85	0.39	0.48	0.38
NH ₄ -N	0.75	1.2	1.4	0.49
NO ₂ -N	0.12	0.11	0.15	ND
NO ₃ -N	1.0	1.6	1.3	1.2
TKN	5.8	2.7	4.5	1.2
N-Total	6.9	4.4	6.0	2.4
Microbiology (MPN/100 mL)				
Total Coliform	30000	90000	160000	50000
Fecal Coliform	1300	8000	9000	3000
E. coli	400	5000	1700	3000
Fecal Strpetococcus	13000	50000	3000	1300
Enterococcus	8000	11000	2300	200

Notes:

1. Units are mg/L unless otherwise noted.

2. Hardness and Alkalinity are reported as mg/L of CaCO₃.

NS: Constituent was not sampled.

Table 3-12: 2006/07 Wet Weather Results for Site 8 (Receiving Water Grabs)

Constituents ¹	Event 1	Event 2	Event 3	Event 4
Conventional				
BOD	<5	<20	<3	<20
COD	32	97	20	32
pH (units)	8.0	8.0	8.1	8.1
EC (μmhos/cm)	780	680	880	810
TDS	470	370	510	450
TSS	36	240	18	62
O&G	<0.7	<0.7	<0.7	<0.8
Metals (Total Recoverables)				
Ag	<0.031	<0.031	<0.031	<0.031
As	<1.6	5.9	<1.6	5.4
B	210	240	180	220
Ba	63	120	46	67
Cd	<0.077	<0.077	<0.077	<0.077
Cr	<0.14	<0.14	<0.14	<0.14
Cu	<1.6	26	<1.6	<1.6
Fe	1600	12000	670	2900
Hg	<0.032	<0.032	<0.032	<0.032
Mn	86	400	38	120
Pb	<0.084	16	<0.084	<0.084
Se	<2.3	<2.3	<2.3	6.0
Zn	42	89	23	35
General Minerals				
Total Hardness ²	220	200	230	240
Ca	66	56	69	71
Mg	14	15	14	15
Na	75	59	76	76
K	11	13	9.8	10
Total Alkalinity ²	170	150	190	180
OH	<3.4	<1.7	<1.7	<1.7
CO ₃	<3.4	<1.7	<1.7	<1.7
HCO ₃	210	180	230	220
Other				
SO ₄	79	59	86	84
Cl	76	58	88	85
F	0.4	0.3	0.4	0.4
P-Ortho	1.5	1.1	1.3	1.3
P-Total	1.4	2.1	1.3	1.4
NH ₄ -N	0.38	0.13	<0.059	<0.059
NO ₂ -N	<0.0017	<0.0017	<0.0017	<0.0017
NO ₃ -N	4.8	4.8	6.6	7.4
TKN	2.5	2.5	0.79	0.99
N-Total	7.3	7.3	7.4	8.4
Microbiology (MPN/100 mL)				
Total Coliform	90000	160000	28000	160000
Fecal Coliform	8000	7000	3000	5000
E. coli	5000	7000	1100	5000
Fecal Strptococcus	24000	22000	1700	17000
Enterococcus	13000	22000	1700	7000

Notes:

1. Units are mg/L unless otherwise noted.

2. Hardness and Alkalinity are reported as mg/L of CaCO₃.

NS: Constituent was not sampled.

Table 3-13: 2006/07 Wet Weather Results for Site 10 (Receiving Water Grabs)

Constituents ¹	Event 1	Event 2	Event 3	Event 4
Conventional				
BOD	<3	<3	<3	<3
COD	<6.5	14	<6.5	<6.5
pH (units)	8.1	7.4	8.1	8.2
EC (µmhos/cm)	230	230	240	250
TDS	97	130	150	130
TSS	6	<3	<3	22
O&G	<0.7	<0.7	<0.7	<0.8
Metals (Total Recoverables)				
Ag	<0.031	<0.031	<0.031	<0.031
As	<1.6	<1.6	<1.6	<1.6
B	<17	<17	<17	<17
Ba	<0.056	<0.056	<0.056	<0.056
Cd	<0.077	<0.077	<0.077	<0.077
Cr	<0.14	<0.14	<0.14	<0.14
Cu	<1.6	<1.6	<1.6	<1.6
Fe	130	54	53	390
Hg	<0.032	<0.032	<0.032	<0.032
Mn	<0.98	<0.98	<0.98	12
Pb	<0.084	<0.084	<0.084	<0.084
Se	<2.3	<2.3	<2.3	<2.3
Zn	<1.4	<1.4	<1.4	<1.4
General Minerals				
Total Hardness ²	85	83	84	89
Ca	26	26	26	28
Mg	4.6	4.5	4.6	4.8
Na	14	14	14	15
K	2.1	1.3	1.5	1.6
Total Alkalinity ²	93	92	97	95
OH	<1.7	<1.7	<1.7	<1.7
CO ₃	<1.7	<1.7	<1.7	<1.7
HCO ₃	110	110	120	120
Other				
SO ₄	12	12	12	13
Cl	3.8	3.5	3.6	3.8
F	0.4	0.4	0.4	0.4
P-Ortho	<0.0062	<0.0062	<0.0062	<0.0062
P-Total	<0.01	<0.01	<0.01	<0.01
NH ₄ -N	<0.059	<0.059	<0.059	<0.059
NO ₂ -N	<0.0017	<0.0017	<0.0017	<0.0017
NO ₃ -N	<0.11	<0.11	<0.11	<0.11
TKN	<0.062	0.19	0.15	<0.062
N-Total	<0.17	<0.17	<0.17	<0.17
Microbiology (MPN/100 mL)				
Total Coliform	110	36	130	500
Fecal Coliform	23	2.0	2.0	4.0
E. coli	23	2.0	2.0	4.0
Fecal Strptococcus	80	4.0	23	70
Enterococcus	4.0	4.0	23	4.0

Notes:

1. Units are mg/L unless otherwise noted.

2. Hardness and Alkalinity are reported as mg/L of CaCO₃.

NS: Constituent was not sampled.

3.3 Analysis of Stormwater Data

For the purposes of assessing the data generated through the San Bernardino County monitoring program, stormwater quality data collected from February 1994 through April 2006, and for 2006/07 monitoring are compared to similar data sets from national and regional studies. Median values from San Bernardino commercial/industrial data are compared to national (NURP) values and results from one other California community. Comparisons are also made of FY 2006/07 monitoring data to relevant water quality objectives from the California Toxics Rule (CTR) and the 1995 Santa Ana River Water Quality Control Plan (Basin Plan).

3.3.1 Comparison with National (NURP) Values

For commercial/industrial land use runoff, the stormwater discharge characterization data of the San Bernardino County Main Program are compared with data collected by the Nationwide Urban Runoff Program (NURP). Included in this comparison are the constituent medians, high (95th percentile), and low (5th percentile) values for eleven of the twelve constituents reported in the NURP study. Also included in this comparison are results of stormwater monitoring for commercial/industrial land uses from Ventura County.

For the purposes of this analysis, summary statistics from one commercial/industrial stormwater discharge characterization site (Site 5) were used. Although Site 2 is designated as a commercial/industrial site, the sample intake is located in Cucamonga Creek and receives runoff from undeveloped, rural, and residential areas upstream of the sampling location. Therefore, Site 2 is not representative of commercial/industrial runoff alone. For these reasons, Site 2 data were not included in this comparison. The comparison of Site 5 commercial/industrial runoff data to corresponding NURP values is presented in **Table 3-14**.

Data specifically representing discharges from residential and open space land uses were not collected during FY 2006/07. A comparison of San Bernardino County residential and open space land use data (1994-2000) to NURP values can be found in the 1999-2000 Annual Report.

As shown in **Table 3-14**, San Bernardino County commercial/industrial (Site 5) median values in most cases fall within or near the range of concentrations described by NURP. However, like Ventura County, the San Bernardino County data exhibit some relatively high values. The San Bernardino commercial/industrial discharge characterization data set from 1994-2006 contains median main program values higher than the NURP 95th percentile range for five of the eleven constituents evaluated: BOD, COD, Total P, $\text{NO}_2 + \text{NO}_3$, and TKN. Data from 2006-07 show an additional constituent (Zn) above the NURP 95th percentile value. Median EMC values for BOD and TKN are also relatively high for the Ventura County data compared to NURP values. Results from the 2006/07 monitoring season are relatively similar to the long-term medians.

Table 3-14: Comparison of NURP and Median Commercial/Industrial EMC Values

Constituent	Units	NURP				Ventura County ⁴	San Bernardino Site 5	
		Median	CV	5% ³	95% ³		1994- 2006 ⁵	2006- 2007 ⁶
BOD	mg/L	9.3	0.31	5.6	15.3	16	24	22
COD	mg/L	57	0.39	30.7	105.8	83.5	165	100
TDS ¹	mg/L	76	0.85	22.6	256.3	70	130	120
TSS	mg/L	69	0.85	20.5	232.1	142	141	150
Cu	mg/L	0.029	0.81	0.009	0.093	0.023	0.03	0.02
Pb ²	mg/L	0.020	0.68	0.007	0.055	0.01	0.02	0.036
Zn	mg/L	0.23	1.07	0.054	0.95	0.13	0.25	0.110
Dissolved P	mg/L	0.08	0.71	0.028	0.23	0.32	0.13	0.315
Total P	mg/L	0.20	0.67	0.074	0.55	0.43	0.6	0.48
NO ₂ +NO ₃	mg/L	0.57	0.48	0.27	1.2	0.58	1.35	1.75
TKN	mg/L	1.20	0.43	0.6	2.3	2.4	3.4	5.8

Notes:

Bold numeric text in cells indicates that value is outside the range of NURP 5th and 95th percentile values.

1. TDS values were obtained from recent studies conducted at several NURP sites (CDM, 1992).

2. Lead values were derived from recent studies based on NURP values (Palmstrom, 1990).

3. Calculated based on the Median and Coefficient of Variance using a multiplier of 1.645

4. VCSQMP Annual Report (2003)

5. Includes all main program monitored events from February 1994 through April 2006.

6. Includes four main program monitored events from December 2006 through February 2007.

3.3.2 Comparisons to Water Quality Objectives

The purpose of this section is to provide a summary of comparisons of San Bernardino County stormwater program data to relevant water quality objectives. Water quality data from the 2006-07 monitoring season were compared with water quality objectives from the California Toxics Rule (CTR) and the 1995 Santa Ana River Water Quality Control Plan (Basin Plan). Only monitoring sites located within receiving waters were included in these comparisons. These sites include Sites 2 and 3, which are located in Cucamonga Creek and correspond to objectives for Reach 3 of the Santa Ana River, and Santa Ana River Sites 8 and 10, which correspond to objectives for Reaches 3 and 6 of the Santa Ana River, respectively. For the purposes of this comparison it was assumed that water quality objectives for Reach 3 of the Santa Ana River may be applied to Cucamonga Creek.

The comparison tables that follow identify relevant water quality objectives for each designated receiving water reach. CTR objectives for metals are adjusted for receiving water hardness; the metals objectives were calculated for these comparisons using median hardness values from the 2005/06 stormwater season. Maximum and median values from the 2006/07 stormwater season are compared to the objectives for each constituent. Bold numbers in the maximum column indicate an exceedance.

Comparisons of data from Sites 2 and 3 to water quality objectives for Reach 3 of the Santa Ana River are shown in **Tables 3-15 and 3-16**. Comparisons of the data from Site 8 to water quality objectives for Reach 3 of the Santa Ana River are provided in **Table 3-17**, and

comparisons of the data from Site 10 to water quality objectives for Reach 6 of the Santa Ana River are provided in **Table 3-18**.

Following are major findings of the comparison between receiving water data and water quality objectives comparisons for the 2006/07 wet season.

- For the 2006/07 wet season, the maximum measured value exceeded the lowest water quality objective for at least two constituents at all sites.
- The urban-influenced receiving water sites (Sites 2, 3, and 8) recorded higher maximum concentrations for metals, nutrients, and conventional constituents than the upstream Santa Ana River site (Site 10). (A comprehensive comparison of data from Site 8 and Site 10 was provided in the 2005-06 Annual Report.)
- The maximum values for COD exceeded objectives at all sites.
- Maximum values for total coliform and fecal coliform exceeded Basin Plan objectives by large margins at all sites.

A comparison of the maximum and median values for data collected 2000-2006 with the Basin Plan and CTR WQOs, as well as EPA stormwater benchmarks, was included in the 2006 Report of Waste Discharge.

The relevance of these comparisons varies with constituents and with the source of the water quality objective or benchmark. For example, stormwater discharges are episodic and of relatively short duration. Therefore, water quality criteria derived from impacts associated with chronic exposure may not be appropriate.

Table 3-15: Water Quality Objective Comparison for Site 2

Constituent	Units	Basin Plan Note on Beneficial Use	Basin Plan Objective	Water Quality Objectives					Main Program Site 2
				California Toxics Rule (CTR) ¹					Maximum Value ⁴ 2006/07
				Acute Freshwater Aquatic Life	Chronic Freshwater Aquatic Life	Human Health (Water and Organisms)	CTR Lowest Criteria	Basin Plan Metals Site Specific Objectives ²	
Conventional									
COD	mg/L	Waterbody-specific	30	—	—	—	—	—	140
pH	pH units	All	8.5	—	—	—	—	—	8.3
TDS	mg/L	Waterbody-specific	700	—	—	—	—	—	150
TSS	mg/L	Narrative ⁵	30	—	—	—	—	—	98
Metals (Total Recoverable)									
Ag	mg/L		—	0.0025	—	—	0.0025	—	ND
As	mg/L		—	0.3400	0.1500	—	0.1500	—	ND
B	mg/L	AGR	0.75	—	—	—	—	—	0.073
Cd	mg/L	LWRM	—	0.0033	0.0020	—	0.0020	0.0008	ND
Cr ⁶	mg/L		—	0.0163	0.0114	—	0.0114	—	ND
Cu	mg/L	LWRM	—	0.0107	0.0073	1.3	0.0073	0.0079	0.040
Hg	mg/L		—	—	—	0.00005	0.00005	—	ND
Pb	mg/L	LWRM	—	0.0570	0.0022	—	0.0022	0.0012	ND
Se	mg/L		—	—	0.0050	—	0.0050	—	ND
Zn	mg/L		—	0.0940	0.0940	—	0.0940	—	0.23
General Minerals									
Total Hardness	mg/L	Waterbody-specific	350	—	—	—	—	—	76
Na	mg/L	Waterbody-specific	110	—	—	—	—	—	17
Other									
SO ₄	mg/L	Waterbody-specific	150	—	—	—	—	—	11
Cl	mg/L	Waterbody-specific	140	—	—	—	—	—	11
F	mg/L	MUN ⁷	0.8	—	—	—	—	—	0.3
P-Total	mg/L	Narrative ⁸	0.1	—	—	—	—	—	0.65
NH ₄ -N	mg/L	Waterbody-specific; four-day average	0.098	—	—	—	—	—	1.3
NO ₃ -N	mg/L	MUN	10	—	—	—	—	—	0.15
Microbiology									
Total Coliform	MPN/100 mL	MUN	100	—	—	—	—	—	30,000
Fecal Coliform	MPN/100 mL	REC1	400	—	—	—	—	—	5,000

Notes:

Beneficial uses: AGR: Agricultural Supply; LWRM: Limited Warm Freshwater Habitat; MUN: Municipal and Domestic Supply; REC1: Water Contact Recreation

ND: Not Detected at the method detection limit used

1. CTR metals objectives were calculated with a median total hardness value of 75 mg/L as CaCO₃ for Sites 2 and 3.

2. Basin Plan Metals Site Specific Objectives were calculated using the following equations with TH = (median) total hardness in mg/L.

Cadmium: $Cd\ SSO = 0.85[e^{[0.7852 \cdot \ln(TH) - 3.490]}]$ Copper: $Cu\ SSO = 0.85[e^{[0.8545 \cdot \ln(TH) - 1.465]}]$ Lead: $Pb\ SSO = 0.25[e^{[1.273 \cdot \ln(TH) - 3.958]}]$

3. Based on Basin Plan objectives for Reach 3 of the Santa Ana River.

4. Bold numbers in Main Program results indicate that maximum value recorded in 2005/06 season exceeds lowest numerical objective.

5. TSS: Technology-based objective for wastewater discharges (narrative standard surrogate).

6. The Chromium VI objective is used to assess compliance for all chromium species.

7. Fluoride: Based on annual average of maximum daily air temperature, 78°F (25.6°C), which corresponds to Basin Plan narrative objective of 0.8 mg/L for temperature range 21.5-26.2°C.

8. Total phosphorus: Recommended objective obtained from Gold Book for the prevention of excessive algal growth due to phosphorus compounds (narrative standard surrogate).

TABLE 3-16: Water Quality Objective Comparison for Site 3

Water Quality Objectives									Time and Flow Composites Site 3
Constituent	Units	Basin Plan Note on Beneficial Use	Basin Plan Objective	California Toxics Rule (CTR) ¹					Maximum Value ⁴ 2006/07
				Acute Freshwater Aquatic Life	Chronic Freshwater Aquatic Life	Human Health (Water and Organisms)	CTR Lowest Criteria	Basin Plan Metals Site Specific Objectives ²	
									Conventional
COD	mg/L	Waterbody-specific	30	—	—	—	—	—	160
pH	pH units	All	8.5	—	—	—	—	—	NS
TDS	mg/L	Waterbody-specific	700	—	—	—	—	—	220
TSS	mg/L	Narrative ⁵	30	—	—	—	—	—	NS
									Metals (Total Recoverable)
Ag	mg/L		—	0.0025	—	—	0.0025	—	ND
As	mg/L		—	0.3400	0.1500	—	0.1500	—	ND
B	mg/L	AGR	0.75	—	—	—	—	—	ND
Cd	mg/L	LWRM	—	0.0033	0.0020	—	0.0020	0.0008	ND
Cr ⁶	mg/L		—	0.0163	0.0114	—	0.0114	—	ND
Cu	mg/L	LWRM	—	0.0107	0.0073	1.3	0.0073	0.0079	0.041
Hg	mg/L		—	—	—	0.00005	0.00005	—	ND
Pb	mg/L	LWRM	—	0.0570	0.0022	—	0.0022	0.0012	0.014
Se	mg/L		—	—	0.0050	—	0.0050	—	ND
Zn	mg/L		—	0.0940	0.0940	—	0.0940	—	0.230
									General Minerals
Total Hardness	mg/L	Waterbody-specific	350	—	—	—	—	—	86
Na	mg/L	Waterbody-specific	110	—	—	—	—	—	29
									Other
SO ₄	mg/L	Waterbody-specific	150	—	—	—	—	—	18
Cl	mg/L	Waterbody-specific	140	—	—	—	—	—	28
F	mg/L	MUN ⁷	0.8	—	—	—	—	—	NS
P-Total	mg/L	Narrative ⁸	0.1	—	—	—	—	—	1.3
NH ₄ -N	mg/L	Waterbody-specific; four-day average	0.098	—	—	—	—	—	1.9
NO ₃ -N	mg/L	MUN	10	—	—	—	—	—	0.31
									Microbiology
Total Coliform	MPN/100 mL	MUN	100	—	—	—	—	—	50,000
Fecal Coliform	MPN/100 mL	REC1	400	—	—	—	—	—	1,700

Notes:

Beneficial uses: AGR: Agricultural Supply; LWRM: Limited Warm Freshwater Habitat; MUN: Municipal and Domestic Supply; REC1: Water Contact Recreation
ND: Not Detected at the method detection limit used

1. CTR metals objectives were calculated with a median total hardness value of 75 mg/L as CaCO₃ for Sites 2 and 3.

2. Basin Plan Metals Site Specific Objectives were calculated using the following equations with TH = (median) total hardness in mg/L.

$$\text{Cadmium: Cd SSO} = 0.85[e^{[0.7852 \cdot \ln(\text{TH}) - 3.490]}]$$

$$\text{Copper: Cu SSO} = 0.85[e^{[0.8545 \cdot \ln(\text{TH}) - 1.465]}]$$

$$\text{Lead: Pb SSO} = 0.25[e^{[1.273 \cdot \ln(\text{TH}) - 3.958]}]$$

3. Based on Basin Plan objectives for Reach 3 of the Santa Ana River.

4. Bold numbers in Main Program results indicate that maximum value recorded in 2005/06 season exceeds lowest numerical objective.

5. TSS: Technology-based objective for wastewater discharges (narrative standard surrogate).

6. The Chromium VI objective is used to assess compliance for all chromium species.

7. Fluoride: Based on annual average of maximum daily air temperature, 78°F (25.6°C), which corresponds to Basin Plan narrative objective of 0.8 mg/L for temperature range 21.5-26.2°C.

8. Total phosphorus: Recommended objective obtained from Gold Book for the prevention of excessive algal growth due to phosphorus compounds (narrative standard surrogate).

TABLE 3-17: Water Quality Objective Comparison for Site 8

Water Quality Objectives									Grab Samples
Constituent	Units	Basin Plan Note on Beneficial Use	Basin Plan Objective	California Toxics Rule (CTR) ¹					Site 8
				Acute Freshwater Aquatic Life	Chronic Freshwater Aquatic Life	Human Health (Water and Organisms)	CTR Lowest Criteria	Basin Plan Metals Site Specific Objectives ²	Maximum Value ³ 2006/07
Conventional									
COD	mg/L	Waterbody-specific	30	—	—	—	—	—	15
pH	pH units	All	8.5	—	—	—	—	—	8.3
TDS	mg/L	Waterbody-specific	700	—	—	—	—	—	510
TSS	mg/L	Narrative ⁴	30	—	—	—	—	—	240
Metals (Total Recoverable)									
Ag	mg/L		—	0.0164	—	—	0.0164	—	ND
As	mg/L		—	0.3400	0.1500	—	0.1500	—	0.059
B	mg/L	AGR	0.75	—	—	—	—	—	0.24
Cd	mg/L	LWRM	—	0.0113	0.0047	—	0.0047	0.0018	ND
Cr ⁵	mg/L		—	0.0163	0.0114	—	0.0114	—	ND
Cu	mg/L	LWRM	—	0.0301	0.0187	1.3000	0.0187	0.0201	0.026
Hg	mg/L		—	—	—	0.00005	0.00005	—	ND
Pb	mg/L	LWRM	—	0.2290	0.0089	—	0.0089	0.0047	0.016
Se	mg/L		—	—	0.0050	—	0.0050	—	0.006
Zn	mg/L		—	0.2380	0.2380	—	0.2380	—	0.89
General Minerals									
Total Hardness	mg/L	Waterbody-specific	350	—	—	—	—	—	240
Na	mg/L	Waterbody-specific	110	—	—	—	—	—	76
Other									
SO ₄	mg/L	Waterbody-specific	150	—	—	—	—	—	86
Cl	mg/L	Waterbody-specific	140	—	—	—	—	—	88
F	mg/L	MUN ⁶	0.8	—	—	—	—	—	0.4
P-Total	mg/L	Narrative ⁷	0.1	—	—	—	—	—	2.1
NH ₄ -N	mg/L	Waterbody-specific; four-day average	0.098	—	—	—	—	—	0.38
NO ₃ -N	mg/L	MUN	45	—	—	—	—	—	7.4
Microbiology									
Total Coliform	MPN/100 mL	MUN	100	—	—	—	—	—	160,000
Fecal Coliform	MPN/100 mL	REC1	400	—	—	—	—	—	5,000

Notes:

Beneficial uses: AGR: Agricultural Supply; LWRM: Limited Warm Freshwater Habitat; MUN: Municipal and Domestic Supply; REC1: Water Contact Recreation

ND: Not Detected at the method detection limit used

1. CTR metals objectives were calculated with a total hardness value of 225 mg/L as CaCO₃ for Site 8.

2. Basin Plan Metals Site Specific Objectives were calculated using the following equations with TH = (median) total hardness in mg/L.

Cadmium: $Cd\ SSO = 0.85[e^{(0.7852 \cdot \ln(TH) - 3.490)}]$

Copper: $Cu\ SSO = 0.85[e^{(0.8545 \cdot \ln(TH) - 1.465)}]$

Lead: $Pb\ SSO = 0.25[e^{(1.273 \cdot \ln(TH) - 3.958)}]$

3. Bold numbers in Main Program results indicate that maximum value recorded in 2005/06 season exceeds lowest numerical objective.

4. TSS: Technology-based objective for wastewater discharges (narrative standard surrogate).

5. The Chromium VI objective is used to assess compliance for all chromium species.

6. Fluoride: Based on annual average of maximum daily air temperature, 78°F (25.6°C), which corresponds to Basin Plan narrative objective of 0.8 mg/L for temperature range 21.5-26.2°C.

7. Total phosphorus: Recommended objective obtained from Gold Book for the prevention of excessive algal growth due to phosphorus compounds (narrative standard surrogate).

TABLE 3-18: Water Quality Objective Comparison for Site 10

Constituent	Units	Basin Plan Note on Beneficial Use	Basin Plan Objective	Water Quality Objectives				Grab Samples
				California Toxics Rule (CTR) ¹				Site 10
				Acute Freshwater Aquatic Life	Chronic Freshwater Aquatic Life	Human Health (Water and Organisms)	CTR Lowest Criteria	Maximum Value ² 2006/07
Conventional								
COD	mg/L	Waterbody-specific	5	—	—	—	—	14
pH	pH units	All	8.5	—	—	—	—	8.2
TDS	mg/L	Waterbody-specific	200	—	—	—	—	150
TSS	mg/L	Narrative ³	30	—	—	—	—	22
Metals (Total Recoverable)								
Ag	mg/L		—	0.0037	—	—	0.0037	ND
As	mg/L		—	0.3400	0.1500	—	0.1500	ND
B	mg/L	AGR	0.75	—	—	—	—	ND
Cd	mg/L	LWRM	—	0.0043	0.0024	—	0.0024	ND
Cr ⁴	mg/L		—	0.0163	0.0114	—	0.0114	ND
Cu	mg/L	LWRM	—	0.0133	0.0089	1.3000	0.0089	ND
Hg	mg/L		—	—	—	0.00005	0.00005	ND
Pb	mg/L	LWRM	—	0.0760	0.0030	—	0.0030	ND
Se	mg/L		—	—	0.0050	—	0.0050	ND
Zn	mg/L		—	0.1150	0.1150	—	0.1150	ND
General Minerals								
Total Hardness	mg/L	Waterbody-specific	100	—	—	—	—	89
Na	mg/L	Waterbody-specific	30	—	—	—	—	15
Other								
SO ₄	mg/L	Waterbody-specific	20	—	—	—	—	13
Cl	mg/L	Waterbody-specific	10	—	—	—	—	3.8
F	mg/L	MUN ⁵	0.8	—	—	—	—	0.4
P-Total	mg/L	Narrative ⁶	0.1	—	—	—	—	ND
NO ₃ -N	mg/L	MUN	45	—	—	—	—	ND
Microbiology								
Total Coliform	MPN/100 mL	MUN	100	—	—	—	—	500
Fecal Coliform	MPN/100 mL	REC1	400	—	—	—	—	23

Notes:

Beneficial uses: AGR: Agricultural Supply; LWRM: Limited Warm Freshwater Habitat; MUN: Municipal and Domestic Supply; REC1: Water Contact Recreation

ND: Not Detected at the method detection limit used

1. CTR metals objectives were calculated with a median total hardness value of 95 mg/L as CaCO₃ for Site 10.

2. Bold numbers in Main Program results indicate that maximum value recorded in 2005/06 season exceeds lowest numerical objective.

3. TSS: Technology-based objective for wastewater discharges (narrative standard surrogate).

4. The Chromium VI objective is used to assess compliance for all chromium species.

5. Fluoride: Based on annual average of maximum daily air temperature, 78°F (25.6°C), which corresponds to Basin Plan narrative objective of 0.8 mg/L for temperature range 21.5-26.2°C.

6. Total phosphorus: Recommended objective obtained from Gold Book for the prevention of excessive algal growth due to phosphorus compounds (narrative standard surrogate).

3.4 Summary and Recommendations

San Bernardino County has successfully completed the monitoring of urban runoff and receiving water for the 2006/07 wet season. Stormwater runoff monitoring results have been compiled and analyzed to characterize stormwater discharges and receiving waters from sites within the Santa Ana River drainage of San Bernardino County. The results of this analysis provide information on the quality of stormwater runoff and its effects on receiving waters within the study area.

The character of San Bernardino County's Santa Ana River stormwater runoff, as measured by median and mean EMC values of selected constituents, has been compared to other stormwater characterizations, both nationally and within California. In general, stormwater quality in the Santa Ana River drainage area of San Bernardino County is comparable to that of other drainage areas. Constituent levels in stormwater runoff from commercial /industrial land uses are somewhat higher than nationally reported values for BOD, COD, Total Phosphorus, NO_2+NO_3 , and TKN. Generally, commercial/industrial land use results are comparable to those reported by another California community (Ventura County).

In general, based on elevated levels detected throughout the stormwater monitoring program, the following pollutants of concern have been identified for Cucamonga Creek and the Santa Ana River:

- Indicator Bacteria (total and fecal coliform)
- Metals (copper, lead, and zinc)
- Nutrients (phosphorus, nitrogen)
- COD (i.e., organic material)
- TSS (i.e., sediment)

3.4.1 Recommended Amendments to Monitoring Program

In previous annual reports, specific objectives for the monitoring program were identified by the Permittees. These objectives, and the current status of each, are outlined below:

Objective	Status
1. Evaluate the effectiveness of specific pollutant control measures.	Currently being evaluated through LID and TMDL programs
2. Assess stormwater contributions to receiving water pollutant loadings and evaluate potential receiving water impacts.	Ongoing
3. Identify and prioritize stormwater pollutants of concern.	Complete
4. Identify sources of high priority stormwater pollutants.	Will be implemented beginning in 2006/07 (see Section 3.7.2)

The County may need to re-evaluate the above program objectives, determine additional program objectives for the new permit term, and re-focus the monitoring program efforts to achieve these objectives.

3.4.1.1. Sample Collection

In previous reports, it was recommended that First Flush and Main Program sampling be replaced by flow-paced composite sample collection through the course of each runoff event monitored to provide a more accurate representation of EMC values and permit direct assessments of mass loadings. In addition, replacement of existing monitoring equipment with modern autosamplers and flow meters was recommended to allow for composite sample collection. As of 2005, autosamplers had been purchased and were being integrated into the program (see Section 3.1.3). During FY 2006/2007, flow-paced composite samples were collected at Sites 2 and 3.

Sampling restrictions related to the 72-hour dry period and the two-week inter-event period should be eliminated, unless required by SBCFCD's stormwater permit. These restrictions are no longer mandated by EPA and unduly restrict monitoring logistics. However, other storm event sampling criteria should be kept (i.e., minimum rainfall event level of 0.25 inches).

3.4.1.2. Sampling Sites

Sample intakes for Sites 2 and 3 should be moved out of the receiving water (Cucamonga Creek) and placed into stormwater discharge pipes carrying runoff from the respective land uses to the creek. This will allow actual characterization of the runoff from the surrounding land uses, i.e., commercial/industrial and agriculture, respectively. It is recommended that SBCFCD continue to monitor discharges only from commercial/industrial and agriculture land uses.

It is recommended that receiving water monitoring be modified so that samples are collected upstream and downstream of the urban influence from locations along Cucamonga Creek and the Santa Ana River (see **Table 3-28**). This will involve the following actions:

- Identifying appropriate upstream and downstream sites (e.g., SCCWRP and UCI programs) along the Santa Ana River in coordination with other monitoring efforts in the watershed.
- Moving Site 1 (a “stormwater discharge” characterization site) slightly upstream of the current location in Cucamonga Creek to a point above the urban runoff influence. However, initial investigation of possible locations for upstream sites indicated practical limitations (e.g., vandalism, access during storm weather) on the use of an automated sampler. Additional review of the area to establish a grab sample site (e.g., at or near the indicator bacteria sampling Site B-1) will be performed.
- Retaining Site 2 (a “stormwater discharge” characterization site) as the downstream receiving water site on Cucamonga Creek.

Monitoring sites are under evaluation to achieve these goals.

Table 3-28: Recommended Receiving Water Monitoring Sites for FY 2006/07

Site No.¹	Location	Primary Land Use	Nearest SBCFCD Rain Gauge	Station Number
(Site 1)	Cucamonga Creek above crosswalls	Open/forest	Cucamonga Canyon at mouth	1309
(Site 2)	Cucamonga Creek @ Hwy 60	Commercial and Industrial	Ontario Fire Department	1335
(TBD)	Santa Ana River – 6 mi. upstream of Seven Oaks Dam	Open/forest	Manzanita Flat	3002
(Site 8)	Santa Ana River @ Hamner Ave.	Urbanized, Mixed Use	Chino County Airport	1360

Note:

1. New site designations should be specified as appropriate.

3.4.1.3. Monitored Constituents

Sampling and analysis for known water quality issues, including all section 303(d)-listed constituents, should be added. Organophosphorus pesticides (especially diazinon and chlorpyrifos) are frequently found to be the cause of toxicity in urban runoff and should also be monitored, as should dissolved metals.

Bioassessment monitoring is also being considered for inclusion in the monitoring program. The addition of non-chemical monitoring would enhance the program's capability to monitor chronic and acute effects of pollutant loads even if specific events are missed.

3.4.1.4. Data Management

It is recommended that SBCFCD enhance the functionality of the current water quality database to allow for efficient, complete, and accurate entry, validation, retrieval, analysis, and reporting of all data collected by the stormwater program. As the County's stormwater monitoring requirements increase, so does the need for accurate and expedient data management. The County's existing water quality database accommodates the water chemistry data generated from the characterization site monitoring that has been completed since 1994. However, it was not designed to store the associated water chemistry quality assurance/quality control (QA/QC) data, nor is it capable of storing the bioassessment data that will be collected during the new permit term. As a result, the County's existing water quality database needs to be enhanced and expanded to meet the growing data management needs of the program.

A comprehensive data management system (DMS) will:

- Efficiently store all program data in a geo-referenced format;
- Allow for enhanced data validation and qualification of water chemistry environmental data through the storage and evaluation of water chemistry QA/QC data;
- Provide improved data manipulation and analysis through user-friendly graphical user interfaces (GUIs); and
- Be modifiable as the program needs change over time.

3.4.2 Pilot Pollutant Source Investigation and Control Plan

3.4.2.1. Background and Overview

In FY 2003/04, the County evaluated historical monitoring data to identify pollutants present in urban runoff discharges and in local receiving waters that warranted additional attention. An evaluation matrix was created based on constituent concentrations relative to regulatory thresholds along with NPDES Permit No. CAS618036 (Permit) requirements and other known concerns. The identified list of pollutants of concern (POCs) pertains to stormwater runoff from the urban area covered by the Stormwater Program. The methodology, POC matrix, and discussion were provided as an attachment, “Identification of Pollutants of Concern,” in the FY 2003/04 Annual Report.

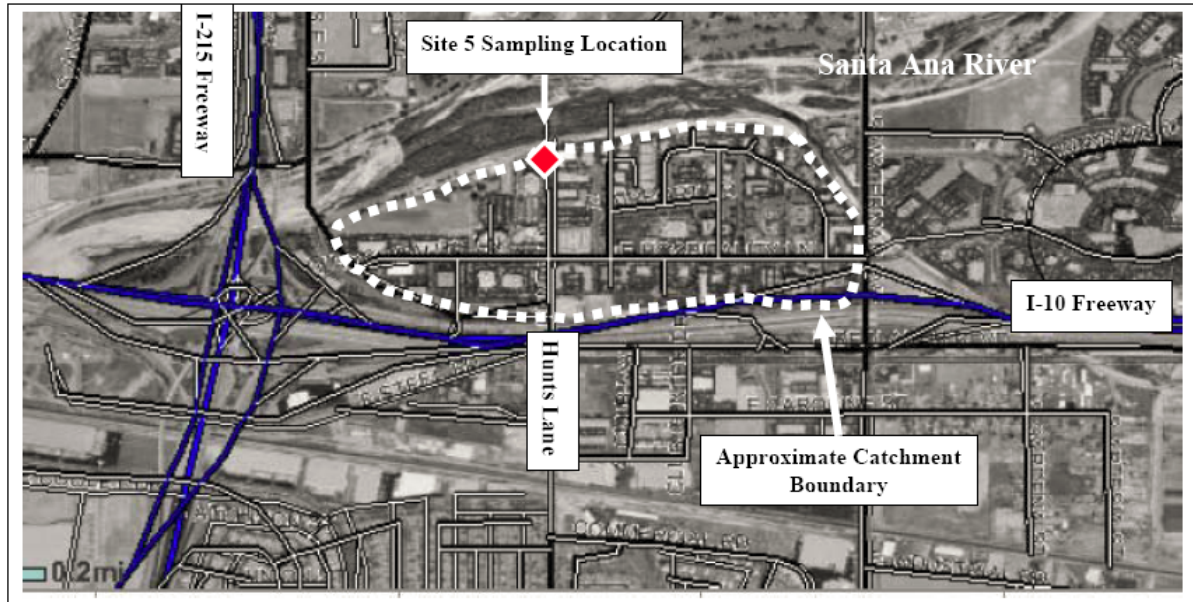
The primary goal of the POC identification effort was to provide information that will assist the Permittees in improving the quality of stormwater runoff and local receiving waters by facilitating the effective implementation of the Stormwater Program. Through this process, the monitoring data can be used by the Permittees to focus control strategies on those pollutants for which investments of public funds are most likely to have a positive impact. This, in turn, facilitates effective reductions in pollutant discharges to the maximum extent practicable (MEP). The identification of POCs is an important step in achieving the MEP standard.

As a result of the POC identification effort described above, the County has developed a Pilot Pollutant Source Investigation and Control Plan (Plan). The Plan centers around urban discharge monitoring Site 5 (see **Figure 3.4.1**), which is a relatively small catchment area. A drainage map for this watershed is provided in **Figure 3-14**.

POCs identified in the 2003/04 effort and addressed in this Plan include:

- *Escherichia coli* (*E. coli*);
- Fecal and total coliform;
- Zinc;
- Copper; and
- Lead.

Coliform bacteria were previously identified as Category 5 POCs (highest priority), and zinc, copper, and lead were identified as Category 2 POCs. The category number corresponds to the total number of applicable POC identification factors (out of five); see the POC Identification Matrix in the 2003/04 Annual Report for further details. The reasonable potential analysis included within the 2006 Report of Waste Discharge has slightly changed the prioritization of the POCs included in the 2003/04 analysis; coliform bacteria remain high priority, but zinc, copper, and lead have been designated medium priority.



*Figure 3.4.1
Drainage Map of Site 5*

The overall source investigation and control process includes the following steps:

- Identify general sources and pathways of POCs
- Compile and review data from local agencies and studies, including San Bernardino County monitoring data, industrial permit data, illegal discharge and illicit connection information, and other relevant data to identify potential additional local sources
- Gather land use information and create a drainage map of the Santa Ana River watershed proximate to stormwater monitoring Site 5 (see **Figure 3-#**)
- Determine need for additional monitoring and develop monitoring plan
- Inspect local commercial and industrial businesses
- Identify and implement BMPs at POC sources

This project is under way. An accurate drainage area map is in preparation that will show land use and the drainage network. Additional monitoring locations will be considered using the map as a guide. Other relevant data are also being gathered and will be evaluated in FY2007/08.

Section 4. Overall Program Effectiveness

The effectiveness of the Stormwater Program can be measured by documenting implementation of BMPs and potentially by measuring changes in stormwater quality. Implementation of BMPs and other Permit or ROWD/MSWMP requirements can be verified and documented, with an underlying belief that water quality will be improved by these actions. However, measured changes in stormwater quality have been much more difficult to discern. This is probably due to numerous confounding factors (such as hydrology and aerial deposition). We are also working within a region that is experiencing rapid population growth and expansion of the urbanized area. We attempt to determine trends in water quality monitoring results to determine if the constituent concentrations are increasing or decreasing over the long term. If constituent concentrations were found to decrease, we would attribute the improvement to BMP implementation, although we lack sufficient data to make a causal connection. The monitoring data compiled by the program to date have not been found to demonstrate such a trend, therefore this report focuses on program effectiveness from the perspective of program implementation rather than trends in analytical sample results.

Implementation of BMPs does result in quantifiable pollution reduction. For example, the street sweeping program prevented over 2,200 tons of material from entering the MS4 system based on the total miles swept and the test debris data. In addition, over 12,000 cubic yards of material were directly removed from drainage facilities. At least 381 discharge/dumping/spills were reported and variously cleaned or stopped. If each discharge prevented or cleaned 100 gallons of polluted material, then 38,100 gallons of polluted material was prevented from entering the MS4 system.

4.1 Program Areas

The MSWMP attempts to address stormwater quality using several program elements that target pollution prevention for known urban sources that are diverse and may be dispersed throughout the watershed. These program elements focus on:

- Residential Sources
- Commercial, Industrial and Construction Sources
- Public Agency Activities
- Verification and Enforcement

There are several major program areas in the MSWMP that must be developed and implemented. Once fully implemented, these programs will reduce pollutants in urban runoff. These program areas are discussed below.

4.2 Illegal Discharges

The illegal discharges program is ongoing. Over the reporting year, 381 discharge events were reported and investigated, compared to 285 the previous reporting year. Most were minor in nature and all were eliminated or permitted.

Through timely reporting and investigation, potential pollutants are prevented from entering storm drains and receiving waters. When mitigation or prevention BMPs are subsequently implemented, future potential spills may be prevented. As seen in Figure 2.1.8, the number of discharge events varies from year to year, but all are responded to. This documents an ongoing process of pollution prevention.

To prevent illegal dumping into streets and catch basins, Permittees maintain stenciling on catch basins with a "no dumping" messages. The Stormwater Program is also involved in the County DA's environmental strike force regarding prosecution of illegal discharges.

4.3 Industrial and Commercial Sources

Industrial and commercial source inspections have occurred at a similar level as previous years. Co-Permittees have completed a listing of potential sources to be included for inspection. Over 13,000 businesses were identified for the inspection program. This year, the ratio of violations to inspections was approximately 60% for the industrial facilities and 41% for commercial sites, which is substantially higher than last year. This may be the result of better inspector training and increased compliance expectations following the Stormwater Program audits conducted last year by the Regional Board.

4.4 New Development and Redevelopment

Co-Permittees implement the New and Redevelopment Program through various existing permitting processes. Each Permittee with land development authority reviews and approves development plans in its jurisdiction. Stormwater quality concerns are addressed by General Plan and CEQA requirements and by requiring most projects to prepare WQMPs. The Model WQMP includes stringent requirements to implement BMPs based on an analysis of pollutants of concern and hydrologic conditions of concern. All projects must implement site design, source control, and/or treatment BMPs to prevent pollution and to minimize stormwater impacts.

Construction sites are well-known potential stormwater pollutant sources. Each Permittee is required to develop an inventory/database of construction sites in their jurisdiction and to prioritize and inspect these sites. Most Permittees have populated the construction section of the MS4 Database with their sites, their prioritizations, and their inspection records. The MS4 Database therefore serves as the required inventory and database. The Permittees are in various stages of implementing these requirements, but construction sites are being increasingly brought into compliance.

4.5 Public Agency Activities

During this reporting year:

Co-Permittees reported an inventory of approximately 8,162 curb-miles of streets, with nearly 100% swept at least once this year. Several Permittees sweep streets as frequently as once per week in some areas. The County does not have a formal street sweeping program because most paved county roads are rural, without curb and gutter, but street sweeping in County areas may be conducted sporadically in response to reported problems. This year a total of over 2,200 tons of sediment and debris were removed from streets swept based on the test area results reported by nine Permittees.

This year, approximately 12,000 cubic yards of materials were removed from drainage facilities by the Permittees. Approximately 78% of inlets, 80% of open channels, 30% of underground drains, and 48% of detention basins have been cleaned by the Permittees.

4.6 Residential Programs

Information flyers, brochures and fact sheets have been prepared to educate the public about residential pollution sources. Permittees are using mass-mailings, radio, billboards, bus shelter posters, displays at libraries and public facilities, and school programs to increase public awareness.

A key effort is the education of the residents in the proper disposal of household hazardous wastes. Locations of disposal sites are heavily promoted by the County Fire Department. The number of participants depositing materials at the HHW collection sites was approximately 37,878. The 3.2 million pounds of HHW collected in FY 2006-07 was almost 50% greater than the 2.4 million collected in FY 2005-06. This may be due to increased outreach and public awareness of proper handling and disposal of these materials, some of which can contribute directly to stormwater pollution.

4.7 Public Information and Participation

The Public Education Program is closely tied to the Residential and Industrial and Commercial Programs. This continuously developing program is extensive and reaches tens of thousands of people each year. Various outreach methods, such as posters, brochures, radio advertising, newspaper ads, newsletters, booth displays, etc., were utilized to increase public awareness (see Section 2.8 for details). It is expected that increased awareness will change polluting behaviors and eventually result in water quality improvements.

A comprehensive outreach program continued throughout the reporting year, including business outreach and cooperation with local Chambers of Commerce and Home Owners Associations. Paid media and non-media outreach was used to provide a variety of contact types for the target audience.

4.8 Program Management

The Permittees evaluated the MSWMP and the existing management structure, as part of the process to develop a new ROWD as application for the fourth-term Permit. The recommended revisions for the MSWMP were submitted to the Regional Board for review with the ROWD in October 2006. These revisions are summarized in Section 1 and in the submitted ROWD and revised MSWMP; see these documents at:

http://www.waterboards.ca.gov/santaana/html/sb_rowd.html.

Section 5. Program Activities for Reporting Year 2007-08

5.1 Illegal Discharge Programs

The Permittees will continue to implement the Illegal Discharges program as required by the Permit. Documentation and tracking of illegal discharges should be improved by the new MS4 Database, and by the work management functions that will be provided by the CityWorks® application.

5.2 Industrial and Commercial Sources

The Permittees will continue to develop their databases of facilities and implement inspection programs based on assigned priorities. Permittees will continue to train their staff and followup on observed noncompliance. Documentation and tracking of these facilities and inspections should be improved by the MS4 database.

5.3 New Development and Redevelopment

The Permittees will continue to implement the requirements of the WQMP. The WQMP will be reviewed and revised as needed as part of the ROWD and new Permit development process.

The HCOC Map is scheduled to be completed and available for use in mid-2008. The District and the Co-Permittees have committed funds to initiate hosting the HCOC Map on the World Wide Web. The map will be available to the Permittees, Regional Board staff, and the public.

5.4 Public Agency Activities

The Permittees will continue to implement BMPs for public agency activities as required by the Permit. This includes:

- Street sweeping programs
- Inspection and cleaning of inlets, open channels, and basins
- Characterization of street sweeping materials
- Implementation of appropriate BMPs for municipal activities
- Training of essential staff

5.5 Residential Programs

Stormwater pollution from residential sources will be addressed primarily through the Public Education /Public Participation program, with education and outreach to residents by various media.

5.6 Public Education and Participation

Public Education and Participation will be coordinated and conducted by SGA until December 31, 2006. Radio, newspaper, and poster advertising will target English and Spanish speakers. After December 31, 2007, public education and outreach is expected to be coordinated by a staff person from the District, with as-needed assistance from consultants such as SGA and the Malibu Foundation. The details are being determined by the Public Education Subcommittee. The Stormwater Program is also awaiting any new or modified requirements that may result from the Permit renewal process. Goals for FY 2006-07 include:

- Reaching the required number of impressions through various media
- Providing outreach materials to the Permittees
- Coordinating and staffing regional education events
- Providing classroom and assembly presentations at area schools
- Continuing business outreach as described in Section 2.8

5.7 Program Management

The Program will continue to develop and implement the MS4 Database for use by all Permittees. The Database should improve documentation and tracking of all program activities and facilitate reporting needs. Necessary program elements will continue to be developed by the Subcommittees. The Cityworks® work-order management system will be implemented in early 2008.

5.8 Monitoring Program

The monitoring program is under evaluation and is being modified. New sampling equipment was purchased and is being incrementally deployed. The program is evaluating constituents that may be contributing to exceedences of water quality objectives in wet weather. Source investigations for problematic constituents will be continued, either by the stormwater program alone or in collaboration with the SMC, CASQA, and other studies.

During December 2004, and January through February 2005, the District met with Regional Board staff and developed a revised Integrated Watershed Monitoring Program (IWMP), as described in the Permit (Monitoring and Reporting Program, III.5). The revised IWMP will serve as a guide to improving the Monitoring Program. We will also coordinate with the statewide effort to develop a regional monitoring program that is being conducted by a workgroup that includes SCCWRP and the State Water Board's Surface Water Ambient Monitoring Program.

The GIS-based mapping of the drainage system for the District was completed in FY 2006-07. However, some Permittees do not have their own GIS systems and the map for these areas is limited. The program will continue to improve the map over time.

5.9 TMDLs

Required monitoring effort will increase substantially as a result of implementing the Middle Santa Ana River Pathogen TMDL. We also anticipate preparation of a monitoring plan as required by the Big Bear Lake Dry Weather TMDL for nutrients. District staff and consultant assistance will conduct this work.

5.10 Training Program

The Stormwater Program will continue to host stormwater training events based on the training needs of the member agencies. Training events planned for the next fiscal year include construction BMP and WQMP training. Additional training materials will be evaluated by the training subcommittee for inclusion in the stormwater library. The Stormwater Program website will also be evaluated for additional opportunities to enhance to available training information and training materials.

5.11 Other Programs

The Stormwater Program will continue to participate in the California Stormwater Quality Association (CASQA), the SMC, the Stormwater Quality Standards Task Force, and in the Task Forces for the Chino Basin and Big Bear Lake TMDLs. We will also participate in developing the Integrated Regional Watershed Management Plan in cooperation with SAWPA.